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COMPUTERWORLD

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User-built CASE tool slashes code burden

BY JAMES CONNOLLY
CW STAFF

NEW YORK — After keeping the lid on a $60 million project for three years, First Boston Corp. last week revealed an internally built computer-aided software engineering tool that the firm used to construct a global trading and clearance system running its core business.

First Boston expects to recover some of its development costs by licensing the core of the trading package and the CASE tool to competitor Kidder, Peabody & Co.

The key to the project was integrating three computing tiers that run a single application, with the user never knowing what system — an IBM-compatible personal computer, a Stratus Computer, Inc. transaction processor or an IBM mainframe — is handling the processing.

The CASE tool is based on a high-level rules-based language using six statements. It was designed to let business people design a program through a set of menus and to automatically generate Cobol, C and PL/I code.

Making it easy

"We have people programming who have never programmed in their lives, and with two weeks of training, they are programming in this language," said Eugene F. Bedell, manager of First Boston's Information Services Department. He added that the tool helped First Boston reduce its programmer-to-systems analyst ratio from 2.7-to-1 to 0.7-to-1. First Boston avoided fourth-

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Moynihan backs off from 1706

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Sen. Daniel P. Moynihan (D-N.Y.) introduced a bill last week aimed at diffusing the controversy surrounding Section 1706 of the 1986 tax law, which affected the tax treatment of computer consultants using brokers.

Moynihan's proposal would replace Section 1706 with a new two-part test for determining whether a computer consultant is an independent contractor or an employee of the broker. The distinction is important because independent consultants get a variety of tax breaks, while employees are subject to tax withholding rules.

Section 1706 requires consultants working for brokers to become employees unless they meet the stringent common-law standards for independent contractors.

Moynihan acknowledged that Section 1706 has had a bigger ef-

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Silverlake's untold tale

High-profile IBM project almost didn't happen

BY STANLEY GIBSON
and JEAN S. BOZMAN
CW STAFF

ROCHESTER, Minn. — If IBM's original plans had not been overturned by a bold stroke, one of the glitziest and most anticipated rollouts in the firm's history would probably have come off as a low-key set of system upgrades.

Instead, a 1986 decision by IBM Vice-President Stephen Schwartz led to last month's announcement of the Application System/400, which merged the System/36 and 38.

In exclusive interviews last week at the AS/400 development and production facility here, IBM officials revealed a number of project details that the company had not previously discussed:

- For AS/400 engineering verification, IBM used its in-house EVE, or Engineering Verification Engine, parallel processor, which consists of 220 parallel processing elements.
- Almost 100 million lines of code were boiled down to the 6.9 million lines included in the OS/400 operating system. A new version of OS/400 was compiled weekly.
- An early version of the AS/400 was ready for testing in Decem-

Continued on page 8

AS/400 workers *were lauded by IBM Chairman John Akers*

Putting 65,000 processors to work

BY GLENN RIFKIN
CW STAFF

When Bill Dunn gets excited, his enthusiasm gushes forth in a river of colorful, expletive-filled descriptions of the world at large and Dow Jones in particular. And Dunn is excited about his new Connection Machine.

Dunn, executive vice-president of Dow Jones & Co. in Princeton, N.J., figures this futuristic 65,000-processor supercomputer is going to put a nasty dent in the aspirations of his competitors in the on-line electronic information business. It is, to him, the embodiment of strategic advantage.

That is why no one at Dow Jones, a traditionally conservative organization, flinched when Dunn's Information Services Group coughed up $5.3 million late last year for two Connection Machines, the 2,500 million instructions per second/2,500 million floating-point operations per second parallel processor being marketed by tiny Thinking Machines Corp. in Cambridge, Mass. The fear of risk was outweighed by the vast potential of the technology.

Dunn, who oversees the Dow Jones News/Retrieval Service along with its other information distribution offerings, was looking for a way to improve those burgeoning businesses, and the Connection Machine seemed like the perfect solution. More than 15 of the innovative computers have been sold to military and private industrial customers, but this installation represents the first business use of the Connection Machine.

GLENN RIFKIN
Dow Jones' Dunn

Dunn's group is pushing hard to have the new system in place by this year's fourth quarter. Jack McConville, vice-president of research at Wertheim Schroder & Co. in New York, follows the on-line data base industry and has

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Apollo down but not out. Ravaged by plummeting stocks, an abdicating president and a lawsuit, the firm still manages to debut aggressively priced 4- and 7-MIPS workstations. Page 4.

3+Opens its lid. 3Com discusses details of its upcoming OS/2 networking system, which will replace the current 3+ late next year. Page 10.

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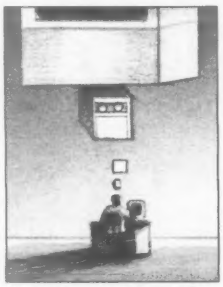

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"We asked [the Secret Service] if we could get up on the roofs and they said, 'Sure, but we'll probably shoot you off.' That cooled our enthusiasm."

JAMES GILES
NETWORK DESIGNER,
DEMOCRATIC NATIONAL CONVENTION

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Simmons to shoulder Bankamerica's burdens

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — After a nearly 10-month nationwide search, Bankamerica Corp. has finally found a new executive vice-president to lead its massive MIS and communications systems operation.

Michael Simmons, 49, replaces Lou Mertes, who quit suddenly last October. Observers speculated that Mertes was pressured to resign because of multimillion-dollar problems with Masternet, the computer system at Bankamerica that tracks the firm's pension plan.

The new executive vice-president comes to the bank with previous experience as president of Fidelity Systems Co., a division of Boston-based Fidelity Investments, where he worked for four years.

Prior to that, he worked three years as MIS director at American Fletcher National Bank & Trust Co. in Indianapolis. He said his new post is easily the biggest challenge of his career.

Rumors undaunting

The troubles with Bankamerica's organization and systems have been widely publicized during the past year. Yet Simmons said he had no reservations about taking the job.

"I've heard the rumors, but I met the management team here, and they are all bright and look like a good team to work with," he said late last week after four days on the job.

The pressure-intensive position that Simmons holds does not daunt him, either: "When you choose data processing as a career, pressure naturally follows. Using technology to make a business successful is not an easy part of the job no matter where you go."

Simmons spearheads the 4,300-employee division known as Bank of America Systems Engineering, or BASE. At last count, BASE was running at least 20 major systems projects concurrently.

"WHEN YOU choose data processing as a career, pressure naturally follows."

MICHAEL SIMMONS
BANKAMERICA CORP.

Simmons said he intends to introduce changes slowly to the bank and only when needed. He will begin by visiting the various DP centers and identifying areas of weakness and strength in the BASE strategy.

Working closely with Pete Hill and Bruce Fadem, two BASE executives who temporarily took over Mertes's job after his departure, Simmons said he wants to streamline costs while making sure the operation runs efficiently.

CW merges software, systems

This issue of *Computerworld* features some changes in our format that are intended to make the newspaper easier to read and more reflective of changes in the MIS market.

This week marks the debut of an expanded technical section, called Systems & Software (see page 23), that replaces the Software & Services and Systems & Peripherals sections. This section will continue our extensive coverage of hardware and software technologies, but with an increased focus on the integration of the two.

The change reflects the more integrated approach MIS organizations are now taking in building information systems. In targeting strategic opportunities, MIS must consider combinations of hardware, packaged software and custom development that work best as a unit. CW has treated systems and software in separate sections for more than 10 years, but the market is now clearly moving its focus toward a combination of the two.

This week we also begin a News Shorts column (see page 6), featuring encapsulated industry news events from around the world. The column will enable CW to provide more news each week to our readers and provide quick reading access to a summary of news events.

For more than 35 years, downhill racing was dominated by Alpine countries. Then in 1984 the Americans captured their first gold medal. Technology made the difference. For the first time, wind tunnel tests were used to improve the skiers' aerodynamics. Technology enhances performance.

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Oracle sought second opinion

Obtained double verification after TPS benchmarks disputed

BY CHARLES BABCOCK
CW STAFF

Oracle Corp. sought an additional auditor after its first auditor disputed benchmark results of its delayed transaction processing system, according to a number of informed sources.

Oracle is slated to announce Oracle Version 6 with TPS today aboard a flight of the British Airways Concorde out of Kennedy Airport in New York. The announcement will include on-line transaction processing benchmark results that far outstrip its competitors and make Oracle TPS appear to be a viable contender with IBM's DB2 on the mainframe.

Unlike competitors Sybase, Inc. and Relational Technology, Inc., however, Oracle is expected to present benchmarks that are verified by not one but two independent auditors.

Oracle spokesmen acknowledged hiring two auditors, claiming that two were needed because the firm wanted to conduct multiple tests on mainframes and minicomputers. The mainframes available for benchmarking happened to be on the East Coast and the minicomputers were on the West Coast, officials said, so the Belmont, Calif., firm decided to employ two parties.

"It was just coincidence," said Mark Rawlins, Oracle's director of marketing communications.

Even with two auditors, Oracle has had trouble getting the benchmark reports finished on time, Rawlins said.

When asked if there had been a dispute with one of the auditors, Rawlins said, "I have no knowledge of that whatsoever. I am not aware of any dispute over benchmark results."

Oracle declined to name the two auditors, but outside sources said it first hired Tom Sawyer, a relational data base consultant associated with the Codd and Date Consulting Group in San Jose, Calif. Sawyer is known to be a meticulous professional and served as the auditor of Tandem Computers, Inc.'s Nonstop SQL benchmark in March 1987, a test widely accepted as an accurate debit/credit benchmark. Sawyer when contacted said he could not comment on the benchmark.

Oracle later hired a second auditor, reportedly Christopher Bird of The Gartner Group in Stamford, Conn. Bird could not be reached for comment.

Oracle and Sawyer were reportedly unable to agree on how to do a TP1 benchmark, an ill-defined offshoot of the debit/credit benchmark. Oracle conducted several tests and reportedly allowed Sawyer to certify those he agreed with. It sought the second auditor to verify additional tests, informed observers said.

WESLEY WONG

Oracle's Ellison

Prior to hiring Bird, Oracle contacted a number of relational data base authorities.

"They approached me too. It was very clear they had certain numbers they wanted to make stick," a data base consultant in Chicago said.

Omri Serlin, president of Los Altos, Calif., market research firm Itom International Co., said he was contacted by Oracle two months ago but declined to participate because he is attempting to establish an industry benchmarking council and did not want to become involved in auditing an individual vendor.

Oracle is believed to have approached The Yankee Group in Boston, which published the report "The Future of Transaction Processing" last year. A Boston-based relational data base consultant who asked to remain anonymous said he in turn was asked to audit the Oracle benchmark by a representative of The Yankee Group. "I think Oracle was having trouble getting the numbers they wanted," he said. His firm also declined the job.

As recently as 10 days before its TPS announcement, Oracle was still looking for an auditor, according to Michael K. Anderson, director of technical services at Aim Technology, Inc. in Palo Alto, Calif.

Oracle Chairman Larry Ellison said Oracle's "debit/credit benchmark is absolutely the same as Tandem's."

West Coast correspondent J. A. Savage contributed to this report.

Despite rocky times, low-end Apollos surface

BY NELL MARGOLIS
and STANLEY GIBSON
CW STAFF

BOSTON — Still smarting from its surprise losing quarter, stock price plunge and subsequent class action lawsuit, Apollo Computer, Inc. filled out the low end of its workstation line last week with two systems based on the Motorola, Inc. 68030 microprocessor.

Debuting were the Series 3500, which is capable of 4 million instructions per second (MIPS) and uses the 25-MHz 68030 chip, and the 7-MIPS Series 4500, the first workstation to incorporate the 33-MHz version of the 68030 and the newly announced Motorola 68882 floating-point math coprocessor.

Analysts called Chelmsford, Mass.-based Apollo's pricing on the new workstations "aggressive." The company has been criticized in the past for not staying price-competitive against an onslaught of young competitors.

According to Apollo, the Series 3500, priced at $7,990, matches the price/performance of the Sun Microsystems, Inc. Sun 386I/150. The $18,990 Model 4500 betters the Sun-4/110's 7-MIPS capacity for $21,000, the company said.

However, such comparisons ignore the fact that the Sun 386I/150 "is basically a transitional machine that lets current MS-DOS users put their toes into the Unix world with one platform, while the 3500 is basically more of the same thing," said Charles Foundyller, president of Daratech, Inc., a market research firm based in Cambridge, Mass.

Apollo confirmed that it will still offer its Series 4000 workstations, which couple price/performance equivalent to the 3500's with a larger power supply and one more bus slot.

An Apollo spokesman said more than 350 of the Series 3500 workstations have shipped; the Series 4500 models are slated for December availability.

Both the 3500 and 4500 are available with either 155M-byte or 348M-byte disk drives and come with an IBM Personal Computer AT-compatible bus that offers seven expansion slots. The new systems are also available as servers. Both come with a Motorola floating-point coprocessor standard — a feature not offered in comparable models from archrival Sun.

More for the desk top

Apollo broadened its workstation line with 4- and 7-MIPS systems based on Motorola's 68030 chips

	MIPS*	CPU	Memory	Price	Available
Series 3500	4	25-MHz 68030	4M to 32M bytes	$7,990 to $24,890	Now
Series 4500	7	33-MHz 68030	8M to 32M bytes	$18,990 to $36,490	December

* Millions of instructions per second

CW CHART

Apollo president resigns

A harrowing week at Apollo Computer, Inc. ended with the resignation last Friday of President and Chief Operating Officer Roland D. Pampel.

Pampel's departure comes in the wake of Apollo's July 7 surprise announcement of a $5 million to $8 million quarterly loss, an ensuing dive in stock prices and, consequently, at least one stockholder lawsuit. A scheduled announcement of two workstations last Monday was largely overshadowed by continuing questions about the financial health and managerial strength of the beleaguered company.

"People shouldn't read too much into [Pampel's resignation]," Apollo spokesman Joe Nahil said.

Others disagreed. "I don't like it," said Timothy McCollum, an analyst at Dean Witter Reynolds, Inc. "The timing suggests that there's more to Apollo's problems than meets the eye."

Pampel's resignation took effect immediately; Chairman and Chief Executive Officer Thomas A. Vanderslice assumed the day-to-day operations he had ceded to Pampel in July 1987.

Russell Crabs, an analyst at Gartner Securities in Stamford, Conn., said that neither Pampel's departure nor Vanderslice's return are likely to have a reassuring effect on stockholders. "It's never one person causing problems," he said.

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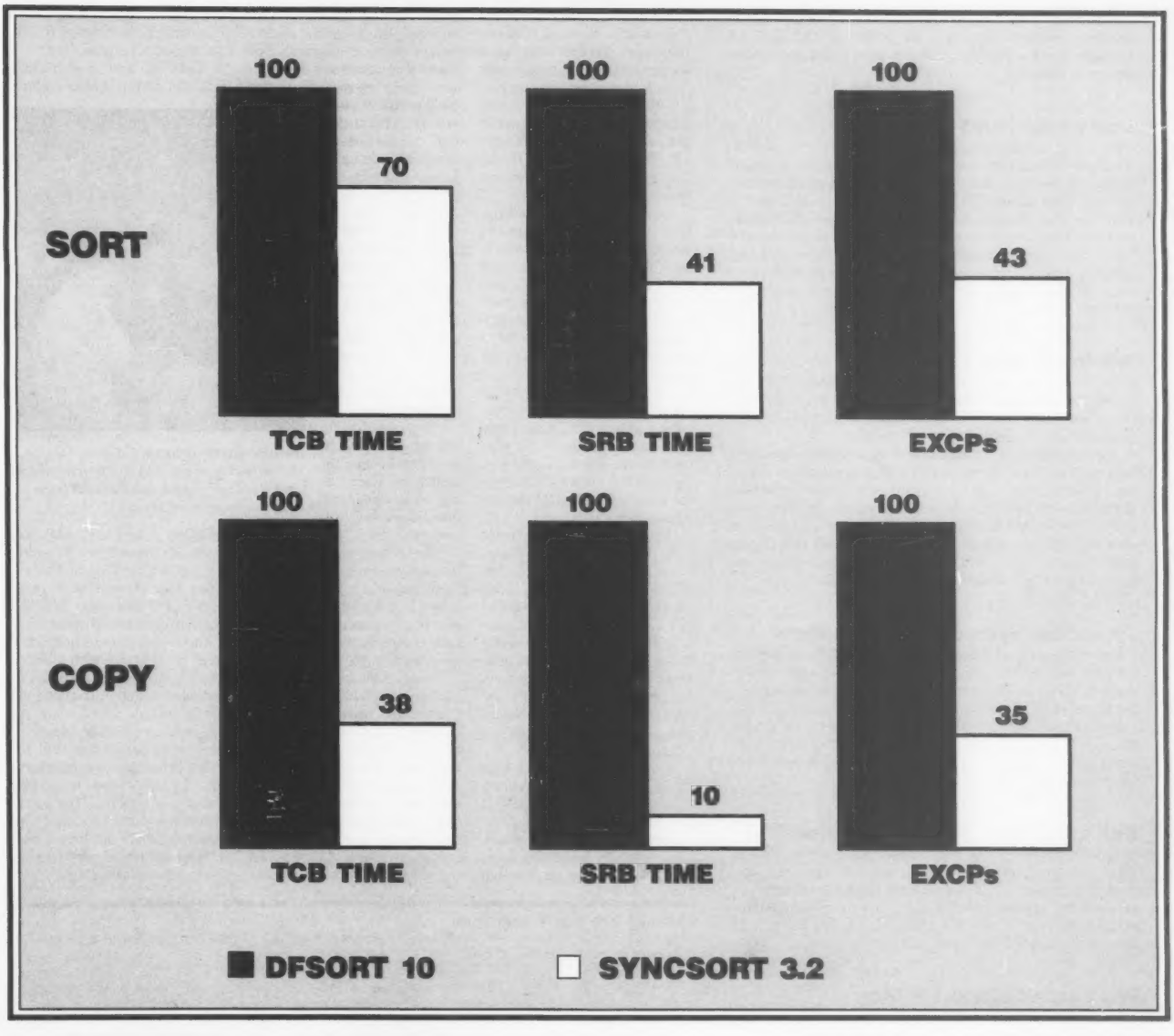

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NEWS SHORTS

IBM says PS/2 report was wrong

An IBM spokesman heatedly denied a published report last week that dealers have been experiencing technical problems with Personal System/2 system boards. Spokesman Scott Brooks said IBM quality control representatives are meeting with dealers but said they do so periodically; he said a report last week in *PC Week* that an unnamed, disgruntled dealer had demanded a meeting to resolve technical problems was unfounded. Another allegation by the publication that IBM has problems supplying PS/2 replacement parts to dealers was also incorrect, Brooks said.

Unisys confirms probe

Unisys Corp. last week confirmed an investigation by the U.S. Attorney General's office in Tucson, Ariz., and said it is cooperating with the probe into alleged overcharges on information systems work at the U.S. Army Communications Center in Fort Huachuca, Ariz. However, in response to a published report that alleged overcharges could amount to as much as $10 million, the company commented: "Any mischarging that may have occurred did not exceed $250,000." The $8 million contract, covering 1982 to 1987, was handled by the former Sperry Corp.

Trade bill passes House

A revised trade bill supported by the computer and software industries moved a step closer to enactment last week when the U.S. House of Representatives approved it by a 376-45 vote. Senate approval is expected later this summer.

Industry lobbyists are hopeful that the trade reform legislation, stripped of a controversial plant-closing provision, will be signed by President Reagan. Reagan vetoed an earlier version of the trade bill because it included a provision requiring companies to provide 60 days' advance notice of plant closings. The computer industry supports provisions in the bill that reform export controls, strengthen intellectual property rights and seek access to foreign telecommunications markets.

Anacomp eyes storage products

Anacomp, Inc. signaled last week that it has left the banking software business far behind when it announced its intent to acquire disk drive and storage media vendor Xidex Corp. for $10 per share, or $415 million. Xidex, with 1987 revenue of $432 million, is roughly four times larger than Anacomp, but the Indianapolis-based firm said it will finance the deal through its banks and other lenders. The Santa Clara, Calif.-based Xidex has posted losses in each of the last two years.

Bell company details ONA plan

Nynex Corp. issued specifications last week for a regional data-over-voice networking service, one of the few Open Network Architecture, or ONA, proposals applicable to corporate data networks. Initial applications for the service include automated teller machine networks, according to Jim Hines, staff director of product development at Nynex Service Co.

PS/2 sales dipped in May

IBM's June Personal System/2 announcements sapped the strength of its sales in May, and the continuing shortage of the more popular PS/2 Models 30 and 50 added to the slowdown. According to Storeboard, Inc. in Dallas, IBM's microcomputer sales dropped to 29% of all personal computers sold through retail stores in May — down 11.8% from the previous month and down a whopping 37.2% from May 1987.

DRAMs shipped by Siemens

Siemens AG announced in Munich that it has begun deliveries of its 4M-bit dynamic random-access memory (DRAM) chips for customer evaluation. The chip represents a quadrupling of the memory capacity of the 1M-bit DRAM without a doubling of the chip's surface area. Siemens said it expects the chip to be in full volume production beginning next year.

Easing life on convention floor

Communications net of LANs, TV hookups solves logistical nightmare

BY JAMES DALY
CW STAFF

ATLANTA — Roger Schneider may very well be the dyed-in-the-wool Democrat he claims, but less than a week before the Democratic National Convention began, the man in charge of its computer operations sounded like a wild-eyed revolutionary.

"We're talking about fundamental changes," Schneider said, stabbing a finger into the air. "Right here and now, this office has become the standard bearer for a new age."

But the director of information systems is not suggesting we bulldoze the White House or march the Supreme Court into the Potomac. During the past seven months, Schneider handtooled a $650,000 communications network, and now he is ready to draw the curtain at this week's convention.

"Four years ago, our major means of communication was yelling down the hall," said Schneider, an affable 30-year-old Alabama native. "Right now, we're sitting on top of 245 personal computers and 23 miles of fiber-optic cable."

The system solves what could have been a logistical horror show: cramming more than 40,000 delegates, party members and press people into Atlanta's 17,000-seat Omni Auditorium. The solution was to divide the spillover between the adjacent Georgia World Congress Center and several hotels and then weave a communications web of local-area networks and television hookups.

The core of the system uses Novell, Inc.'s Netware 2.1 operating system to link nine LANs in three downtown sites and party headquarters in Washington, D.C., with the convention floor. The Atlanta police can also tap into the network through a series of communications servers with code names like "Mike," "Jessie" and "JFK."

The possibility of using rooftop microwave links was also kicked around but was quickly snubbed by security-conscious Secret Service officials. "We asked if we could get up on the roofs and they said, 'Sure, but we'll probably shoot you off.' That cooled our enthusiasm," network designer James Giles said.

One of the most challenging aspects of the job was building the system's variety of custom software applications. On his first day, Schneider was greeted by a lopsided stack of letters detailing some "incredibly bizarre" DP requirements.

"We'd have VIPs writing in saying 'I need four limos, 115 telephone lines in my hotel room, six hotel suites and two nephews hired,' " he said.

The solution was to write customized programs — dozens of them. Schneider, who is on sabbatical from his job as vice-president of a local software development company, and a corps of 10 programmers got to work.

Using Ashton-Tate Corp.'s Dbase and Nantucket Corp.'s Clipper, the team worked furiously to crank out more than 100 programs. Few stones were left unturned. Convention party planners can even fine-tune their social calendar by tapping into a facility management system data base. Earlier this year, a questionnaire was sent to local hotels and restaurants asking a battery of questions ranging from whether they serve kosher food to the number of buses they would allow to park out front. A team with an ultrasound gun was also sent out to measure the size of every available meeting room. A computer-aided design (CAD) system will arrange seating.

The CAD system also came into play on the Omni Auditorium's floor, where it is being used to quickly reconfigure delegate seating. "Our seating plan sometimes goes through four revisions a day," Schneider said. "It would drive an architect nuts."

ALAN S. WEINER/GAMMA LIAISON

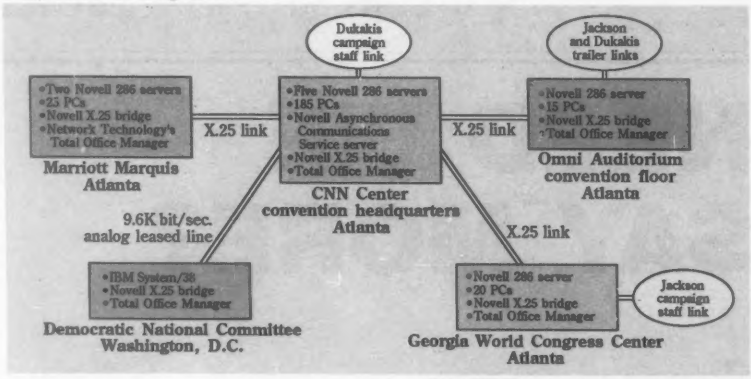
Democratic National Committee
members at work on their computers, which are linked in network fashion with their offices throughout Atlanta

On the convention floor, delegates are provided with a Unix-based system that resembles a portable computer attached to a telephone. A touch-sensitive screen allows voting on party planks to be quickly tabulated.

But Schneider assured others that high tech will not step on the toes of one tradition: State party chairmen will not be denied the chance to bellow out their votes for the presidential candidate on the convention's final night.

Pulling the party together

Networks in use at the Democratic National Convention feature links to candidates' staffs and to party headquarters in Washington, D.C.



INFORMATION PROVIDED BY BUSINESS COMPUTER RENTAL

AT&T tries to defuse OSF Unix threat

BY JULIE PITTA
CW STAFF

SUMMIT, N.J. — In what appears to be a frantic attempt to counter the threat posed by the Open Software Foundation (OSF), AT&T has hosted two meetings of its Unix licensees this month to stave off potential defections.

"OSF has clearly brought some pressure to bear on AT&T; otherwise, they wouldn't be holding these meetings," said Paul Maritz, general manager of the networking and Xenix unit at Microsoft Corp. Maritz attended the first of the two meetings held earlier this month at AT&T's Unix development headquarters here.

A second gathering of AT&T's Unix licensees was held last week in Boulder, Colo. AT&T, with Data Systems Group President Robert Kavner in attendance, again tried to reassure its licensees, according to those present. At the meeting, AT&T said it would consider altering certain conditions of Unix licensing, a company spokesman said.

Tom Jermulak, vice-president of advanced systems at Silicon Graphics, Inc., attended last week's meeting and said AT&T admitted that publicity surrounding its co-development effort of Unix System V, Release 4 with Sun Microsystems, Inc. has caused it serious harm. OSF, an organization composed of representatives from computer industry heavyweights, such as IBM and Digital Equipment Corp., was established largely in reaction to Sun's participation in AT&T's Unix development.

Jermulak said he is pleased that AT&T may modify its licensing conditions as the result of pressure from its licensees. "There's been a lot of hassle over certain licensing issues," he said. "If you wanted to ship Release 3, you were required to use their RFS networking scheme that no one else runs."

Sun worshiper?

An AT&T spokesman said the relationship between Sun and AT&T remains strong despite a recent characterization by a Sun official that relations are rocky. "They're an equity partner of ours, and they bring a lot to the table in terms of development," he said. The purpose of the two meetings held this month was cooperation, he said, declining to offer further details.

For its part, Sun is downplaying its role. In an interview with *Computerworld* conducted after the AT&T meeting, marketing vice-president Ed Zander emphasized that AT&T owns the Unix operating system. "We are a contractor of the technology," he said. "If the licensees feel better after the meeting, then that's great."

Zander, who dismissed a statement made by a Sun official in recent weeks that it may join the OSF, said both companies are working furiously to accelerate release schedules and that Sun's relationship with AT&T is "great."

HP counters Apple suit

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Hewlett-Packard Co. last week blasted Apple Computer, Inc. with a biting countersuit alleging that Apple's graphical interface copyrights — the subject of Apple's highly publicized and debated lawsuit last March against HP and Microsoft Corp. — were obtained through fraud and deliberate misrepresentation.

The suit also charged Apple with unfurling a "sham litigation" against HP and Microsoft to create a microcomputer monopoly using a graphical user interface. HP's New Wave and Microsoft's Windows 2.03 were said to infringe on Apple's patents on its Macintosh interface in the Apple suit [CW, March 28].

An Apple spokeswoman said HP's countersuit claims "are without merit" and that there was "nothing novel or significant about their response."

In the countersuit, HP claimed that Apple's lawsuit was "designed to and did in fact result in inhibiting and discouraging the sale of HP products which compete with Apple." However, HP officials have said on more than one occasion that the Apple lawsuit actually created a surge of interest in New Wave.

According to HP's countersuit, Apple procured its graphical interface copyrights "through fraud and/or inequitable conduct practiced upon the U.S. Copyright Office." The suit said Apple knowingly misrepresented or omitted facts from the copyright office regarding "the lack of originality and derivative nature" of its interface, which in fact "had been created and developed by others, including Xerox Corp." Therefore, the suit said, Apple's copyrights are unenforceable.

In addition, HP has "long planned to enter this market with its New Wave interface system, a major advance over Apple's system in terms of functionality and performance capabilities," the suit said.

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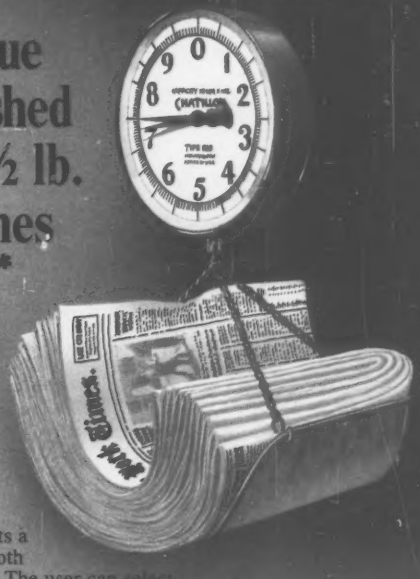

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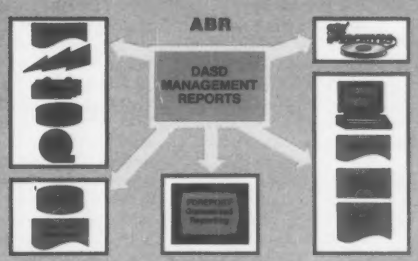

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Silverlake

FROM PAGE 1

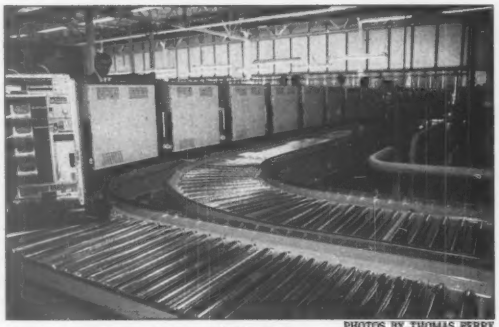
ber 1986; it consisted of first-pass hardware and a version of OS/400.

• The original AS/400 blueprint did not include the low-end Models 10 and 20 and the entry-level 5363. The decision to add those tower configuration models came in November 1986. They implemented the AS/400 architecture in CMOS technology rather than the bipolar implementation used in the larger rack-mounted models.

• A ½-in. tape cartridge, intended for the machine at rollout time, was killed earlier this year. A replacement ½-in. subsystem is in development.

So *that's* why

The project was code-named Silverlake by System/36 and 38 programmers and planners to symbolize their home here; Silver Lake is a public park located near the center of Rochester that is popular among local residents and is a haven for numerous Canada geese. The importance of the project and its high-profile local announcement, over which IBM President John Akers presided with several *M*A*S*H* characters, gave the Rochester employees a major morale boost.



PHOTOS BY THOMAS PERRY

Systems roll *on Rochester AS/400 line*

IBM's Thomas Furey *headed development effort*

In fall 1985, Schwartz, then president of the System Products Division, was faced with a "safe" plan to enhance the System/36 and 38 separately. However, Schwartz and mid-range developers had toyed with the idea of merging the product lines. Several Rochester engineers had developed a prototype of a System/36 execution environment running on a System/38. The mock-up used an RPG compiler and an Operator Control Language interpreter.

In February 1986, Schwartz gave the OK for the merger project to proceed and soon assigned Thomas Furey to take charge of development as Rochester laboratory director.

According to Furey, there was no fallback strategy in case the unusual plan failed. Although the System/38 could have been enhanced readily as a stopgap, the System/36, more difficult to enhance, might have been left hanging had the project not panned out.

While the groundwork was being laid for Silverlake, the Rochester plant was putting the finishing touches on enhancements to the System/36 and 38 that were announced in June 1986.

In May and June of that year, Furey reorganized the Rochester engineering and programming departments. By the end of 1986, a prototype was operational. However, at that time, the code name Silverlake became public. Furey, who said he was "appalled" at the leak, renamed the project Olympic.

In November 1986, Furey said he became convinced that Silverlake needed several low-end processors that were not then planned. He moved to add the Models B10 and B20 and the System/36 5363, calling in Entry Systems Division product manager Duane Dueker to play the lead in the effort.

Furey said last week that the 5363 will be sold for approximately two years, until the AS/400 architecture can be further reduced in size and price.

Timing is everything

To get the operating system home on schedule, IBM tried a new kind of software design process, according to Richard A. Sulack, an AS/400 programming product manager. "We had a just-in-time approach," Sulack said. "Every week, we built a new operating system. Sometimes as many as one million lines of code were integrated [into the operating system] every week."

It was a building-up process, explained Furey. Without it, other parts of the AS/400 team, scattered throughout 32 IBM sites worldwide, would have had to wait before they began their work. The new approach is being studied by other IBM laboratories for possible adoption outside Rochester, he said.

Throughout the process, comments and revisions from software engineers and IBM customers contributed one-tenth of OS/400's code, Schwartz said. "It was a lot of little things, but it added up to 700,000 lines of code."

But Rochester's disciplined software development, pushed through with many production goals, led to a coordinated effort. Programmer creativity was traded off for efficiency. "You can't have unbounded change, because that impacts the product at the system level," Furey said. "People had to follow rules, but we felt we had to manage the change."

The final hardware result — the AS/400 architecture — will last until the year 2000, according to Bill Kempke, a high-end hardware product manager at IBM.

IBM posts 6% growth in quarter

BY CLINTON WILDER
CW STAFF

ARMONK, N.Y. — Tight cost controls helped IBM weather a lull in its product cycle to post solid, if unspectacular, growth in the second quarter ended June 30.

IBM's operating income, not including a $600 million charge for its recent work force reduction, rose 9% over year-earlier levels in the quarter. Expenses increased less than 6%, not including the charge.

The company reported Friday that overall revenue was up 6% to $13.6 billion from $12.8 billion in the second quarter of 1987. Net profits, with the costs of reducing the work force factored in, dropped to $964 million, or $1.63 per share, compared with $1.18 billion, or $1.95 per share, a year earlier.

Analysts said the results were encouraging in what was a buying pause period for mid-range and mainframe customers.

Donald Young of Sanford C. Bernstein & Co. said IBM's revenue was adversely affected by its product cycle, with mid-range users awaiting the recently announced Application System/400 and 3090 buyers awaiting the expected summer introduction of F-model upgrades. "IBM showed signs of improvement on very little revenue growth," he said.

One possible warning sign for IBM was a slowdown in the growth of software sales. The growth star of IBM's business segments for the past two years, software revenue increased 15% over year-earlier levels but only 3% over first-quarter sales. Software revenue in the first quarter, in contrast, was up 22% over the first quarter of 1987.

MCI buying back

Separately, IBM and MCI Communications Corp. announced that MCI will buy back IBM's 16% stake in the carrier.

MCI, which had announced such intentions earlier this year, will pay $677 million for the stock. But IBM will buy $400 million worth of a new class of MCI preferred stock paying 7.35% interest.

"That's a vote of confidence for MCI," said analyst Charles Nichols of Bear Stearns & Co. "But I don't see any change in their partnership. IBM has been a passive, not active, investor."

No. 2 mainframe maker Unisys Corp., also reporting second-quarter results last week, showed continued evidence that it is holding the line on expenses.

The firm's profits jumped 34% over year-earlier levels to $162.3 million, or 78 cents per share; revenue climbed just 5% to $2.39 billion.

User input now welcome at IBM

Early customer review of the IBM Application System/400 as it was being developed was so successful that the practice is likely to be continued, according to Stephen Schwartz, vice-president and general manager of IBM's Application Systems Division.

"I think what you see is a new way of life" for IBM, Schwartz said last week during an interview at the Rochester, Minn., plant where the AS/400s were developed. "I think we knew more about user reaction to this product before we announced it — by a lot — than any other product in our history."

IBM's Schwartz

Schwartz said early user review may blunt later criticism of IBM products at users group meetings. He also shed some light on the AS/400's future development. Among features users can anticipate are these:

• The AS/400's power will come to rival that of today's 370 architecture mainframes. "By the early 1990s it will encroach, from a horsepower standpoint, on the power range of the low-end 3090s," Schwartz said. He added, however, "the 3090 will always stay a long way in front of the AS/400."

• Encroachment of the AS/400 on large corporate accounts, the target of the 9370, is apparently not a major IBM concern. "I believe the money we have invested in ease of use [for the AS/400] will pay off in corporate departments as well," Schwartz said.

• Systems Application Architecture (SAA) will one day ease migration from AS/400s to IBM 3090s and successors. That path will become more important as medium-size businesses that buy the AS/400 grow into major enterprises, Schwartz said. "As SAA gets implemented at the end of this decade and the early 1990s, the ability to migrate from an AS/400 to a 3090, if required, will become orders of magnitude easier."

• Data-base-to-data base links between AS/400s, engineering workstations and IBM 3090 mainframes will emerge. This will enable Unix workstations to access data stored on the AS/400. "We do not plan to put AIX [IBM's Unix] on the AS/400, but we do plan to provide good attachment to AIX workstations," he said, adding that Ethernet capabilities will be added eventually, but not this year. The IBM 9370, meanwhile, will be positioned as a number-crunching Unix and computer-aided design and manufacturing processor, he said.

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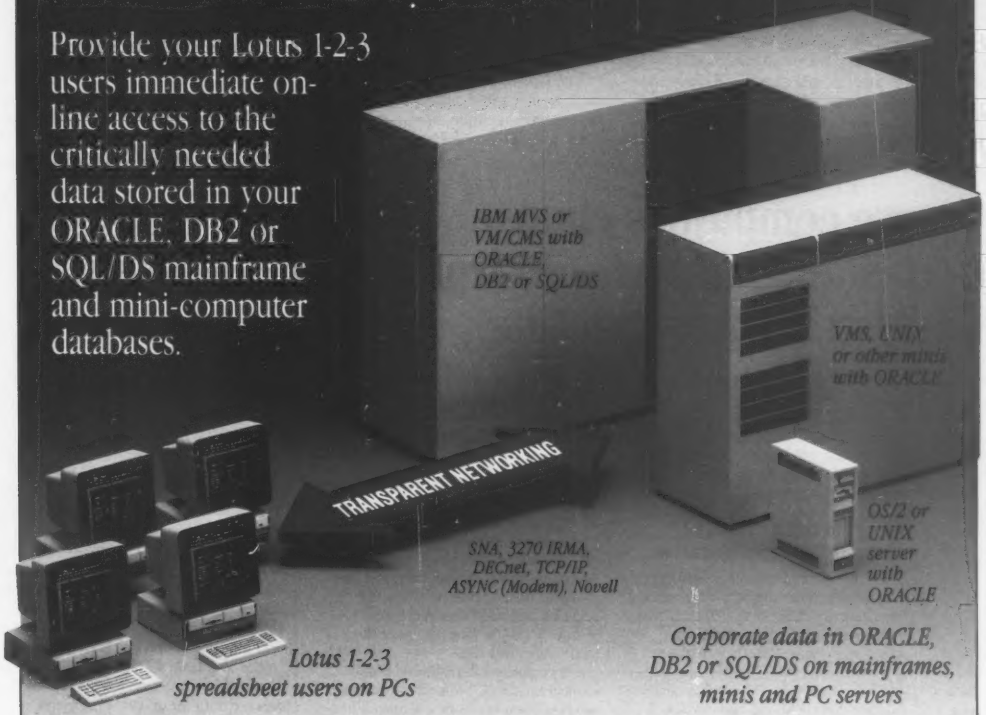
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COMPUTERWORLD

3Com lubes OS/2 chassis

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. last week detailed pricing, shipping and configuration data on its OS/2 network operating system, 3+Open, which will make the company the first networking vendor to ship an OS/2 product.

3Com also confirmed that 3+, the current version of its software, will be phased out, most likely starting in late 1989.

"A year from now, there will be no reason to purchase 3+ over 3+Open," said Eric Benhamou, general manager of 3Com's Software Products Division.

By then, the full suite of networking services available now under 3+ will have been ported to 3+Open, he said.

Users will be able to fully integrate 3+Open with the 3+ generation of network products and services, 3Com claimed.

Taking a page from Novell, Inc.'s book, 3Com said it plans to market 3+Open software in two classes — Entry System and Advanced System — with a choice of dedicated or nondedicated file service.

3+Open includes Microsoft Corp.'s OS/2 LAN Manager and Microsoft and IBM's OS/2 for the file server. Both versions are slated to ship in October.

Looking to next generation

The Advanced System configuration reportedly will enable users to take advantage of the coming generation of distributed applications being developed under OS/2 for a variety of environments, including products from IBM, Apple Computer, Inc., Digital Equipment Corp., Hewlett-Packard Co., AT&T's Unix and Transmission Control Protocol/Internet Protocol.

3+Open Advanced System will support an unlimited number of users per server and multiple servers as well as LAN-to-LAN and LAN-to-host connectivity. It costs $2,995.

A second version of Advanced System is customized for 3Com's dedicated Intel Corp. 80386-based 3S/400 file server and costs $3,495 per server. It includes server and workstation software; 3+Open tape backup; 3+Open Start, which is server booting for DOS workstations and 3Com's 3Station; and 3+NetDOS.

The Entry System, targeted at standalone local-area networks with up to five nodes, features a low price and ease of installation, 3Com claimed. It costs $995.

The two systems share a number of features, such as concurrent DOS and OS/2 workstation support. Both also provide network security tools and administration, but in different degrees.

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Folk leaves Ashton-Tate

BY KATHY CHIN LEONG
CW STAFF

TORRANCE, Calif. — After three years with Ashton-Tate Corp., Roy E. Folk, executive vice-president and general manager of its software products division, has resigned to pursue personal interests.

"I felt good about the things I've done here, and now I'd like to pursue some personal investment opportunities," Folk said. "I still want to be involved in technology and the industry. I have the venture capital contacts to start another company, but I have no plans to do so right now."

The resignation, effective Sept. 15, comes at a time when Ashton-Tate's key development product, Dbase IV, has been delayed until the end of September.

Folk carried major responsibility for the project until a month ago. The company felt that Dbase IV needed full-time attention and gave supervisory duties to Eric Kim, data base business unit manager, and William Stow, vice-president of development.

Although the product is ridden with bugs, Ashton-Tate President Luther Nussbaum guaranteed Dbase IV will ship by Sept. 30.

Amicable separation

Observers speculated that Dbase IV was wrested away from Folk's hands. However, Nussbaum denied the charge.

"Roy had many projects going on, and we needed some people to give it 100% attention to get it out the door," Nussbaum said. Folk was willing to part with the project, he added.

No one will be replacing Folk, and his position will be eliminated. Instead, the company will accelerate its plan to establish separate business divisions for the Apple Computer, Inc. Macintosh, data base, presentation products, decision support and publications.

Folk, 42, said that after leaving the company he hopes to spend more time with his wife and two sons. Folk first came to Ashton-Tate on a consulting basis at the request of Ed Esber, with whom he had worked at the now-defunct Visicorp spreadsheet software company. He served as executive vice-president of marketing in strategic planning and was promoted to his current spot in 1986.

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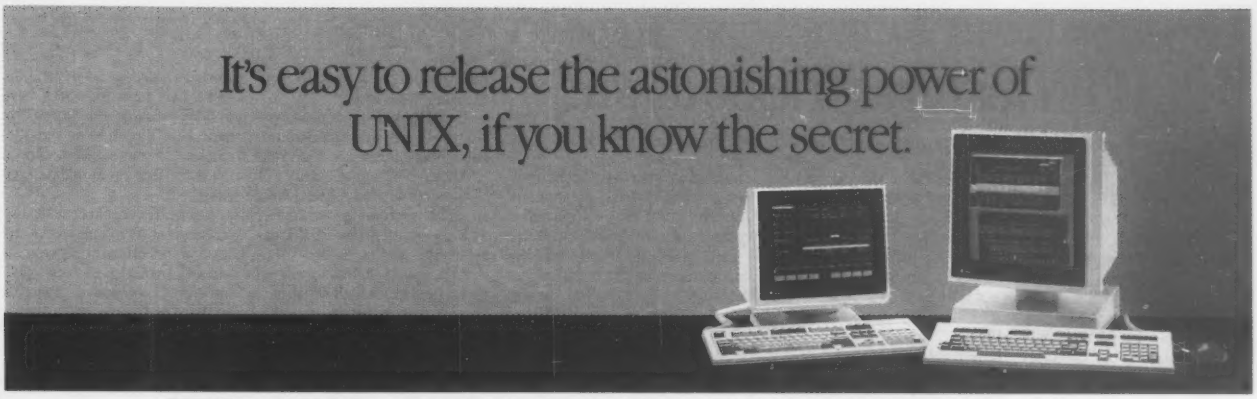

AT&T 605 BCT terminal (left) shown with AT&T PMX/TERM menu. AT&T 630 MTG terminal (right) displays text editing on two hosts, simultaneously.

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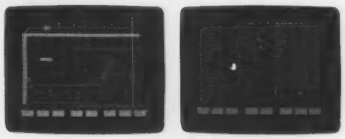

AT&T 620 MTG terminal (left) supports common business graphics interfaces. AT&T 615 MT (right) is the recommended multitasking UNIX System Administration terminal.

AT&T's windowing technology, built into the 600 Series, provides a seamless link to UNIX System V's multitasking capability and gives the terminals unprecedented windowing power. The result is that one 600 Series Terminal can do the work of several ordinary ones, saving you time, money and space, and improving productivity.

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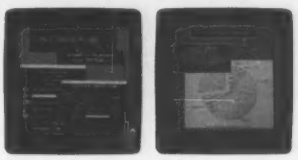

AT&T 630 MTG terminal: Provides dual-host access and down-loadable applications (left); provides high resolution display of engineering or business graphics (right).

In addition, the AT&T 600 Series Terminals offer full PC terminal capability in the UNIX System environment so you can unleash the power of both UNIX System V and MS-DOS* applications for your remote terminal users.

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Will APPN features trickle down?

IBM hints that AS/400 version of protocol could be folded into SAA

BY ELISABETH HORWITT
CW STAFF

RYE BROOK, N.Y. — Enhancements to IBM's Advanced Peer-to-Peer Networking (APPN), which accompanied the introduction of the company's Application System/400, may provide intelligent routing and directory functions that users have been waiting for.

However, vendor spokesmen conceded that these features have some limitations and remained inscrutable about whether APPN will achieve an IBM Systems Application Architecture (SAA) status — even while hinting at the likelihood of this event.

Bringing the networking protocol into SAA could potentially benefit many network users by making APPN's unique features available on other major IBM and even non-IBM systems, since the now-proprietary protocol would move into the public domain.

One interested user is Continental Insurance Co., which currently uses APPN to connect IBM System/36s at some of its branch offices.

"When you insert another node on the network, it just tells the two adjacent nodes it's there, and away you go," said John Vande Creek, the Neptune, N.J., insurance firm's vice-president of systems architecture. "I am anticipating those capabilities for the AS/400; what would make it better is when we can do that with 370s as well."

Spice of life

Originally developed for the System/36, APPN provides a variety of networking functions that IBM has yet to supply for VTAM and Systems Network Architecture (SNA) networks of mainframes.

In particular, APPN systems automatically maintain tables of the location of active nodes on the network, "so you don't have to take down the whole network every time you change a node, as you have to do with VTAM," Vande Creek said.

Now IBM has quietly announced more sophisticated networking functions for the AS/400 version of APPN.

Two important features offered on the AS/400 version of APPN did not appear in the customer letters of announcement but rather in a technological publication that IBM is just beginning to make generally available.

The first is the ability to automatically update the tables of APPN nodes each time a user, file or other resource is moved from one AS/400 to another.

The ability to automatically keep track of users moving from one APPN node to another would be extremely useful to Continental Insurance, Vande Creek said.

"We're using APPN right now in a few isolated locations, but we intend to go to full implementation" across the company's installed base of approximately 2,000 System/36s and a possible future AS/400 installation, he said. He added that with many users in the organization moving frequently, "I might have a lot of work to do to manage those directories."

Unfortunately, it is not advisable to allocate more than a limited number of users or resources to their own logical units, or LUs, according to Chris Jones, an IBM systems programmer who co-directed the APPN development project.

LUs enable APPN nodes to access and track individual network resources; however, the more LUs network nodes have to keep track of, the more complex the directories and the more CPU and network time it takes to keep them updated, he explained.

Congestion could be a serious problem for APPN networks, according to Edward Stevens, a support manager at New York software company Systems

The Power of Automated Operations

Strategies, Inc. "In a large network, I could see 80% of traffic being related to [updating of] directory information," he said.

Another source of congestion is that APPN nodes must broadcast queries throughout the network every time a user or program requests a remote resource whose location is unknown.

IBM's Jones pointed out that the second time the request is made, the system has its location on record, so it can send directly to the correct node.

The AS/400 version of APPN can also minimize traffic congestion by efficiently routing transmissions, IBM said.

APPN's new ability to provide intelligent routing makes the system competitive with Digital Equipment Corp.'s Decnet, according to Frank Dzubeck, president of Washington, D.C., consulting firm Communications Network Architects, Inc. Another APPN advantage, he added, is the ability of the network to heal itself after a crash or glitch without needing manual reconfiguration of tables.

The problem is that this new, powerful APPN is still limited to the AS/400. What everyone wants to know is when APPN's new capabilities will be made available for traditional SNA networks.

APPN could potentially become an extension of SNA and an element of SAA, but it currently belongs to neither architecture, Jones said.

He conceded that APPN's ability to automatically update network topology would be a useful addition to SNA; it would simplify maintenance of traditional hierarchical networks in which "everything needs to be defined and you need a staff of people to do it," he said. However, converting such networks to APPN could prove difficult organizationally as well as technically, because "big, installed, humongous networks resist change," Jones added.

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IBM claims Netview no CPU hog

BY ELISABETH HORWITT
CW STAFF

RESEARCH TRIANGLE PARK, N.C. — Seeking to refute competitors' depictions of Netview as a computer hog, IBM last week released the results of internal benchmark tests that indicate its network management system uses only a modest amount of CPU time on an IBM 3090 or 9370 host.

In one test configuration, Netview on a 3090 Model 200 running MVS monitored terminal-to-application sessions running on another 3090 Model 200; both hosts used VTAM Version 3, Release 2.

Benchmark tests measured the number of CPU seconds it took for the configuration to perform activities, such as host activation and deactivation and logon and logoff, with and without Netview. In each case, Netview's presence resulted in only a slight increase in CPU time.

For example, it took a host running Netview Release 2 approximately 1,600 CPU seconds to process 30K logical unit, or LU, logon sessions; it took 1,400 CPU seconds without the network management system. The added seconds are associated with the need for Netview to collect session awareness data from VTAM and process it, IBM said.

Another benchmark test measured Netview's CPU utilization when the system is sending and receiving data on LU-to-LU sessions as well as processing logon and logoff activity. The test found that Netview Release 2 uses up 20% of a 3090 Model 20 host's CPU resources when it is handling the activity of 30K LUs.

On a 9370 Model 60 running VM, Netview Release 2 used up approximately 6.3% of CPU resources when handling 45 users performing the activities described above. In contrast, Netview Release 1 used up almost 10% of CPU resources in the same configuration. Release 2 outperformed Release 1 consistently in all other tests performed in the study, IBM said.

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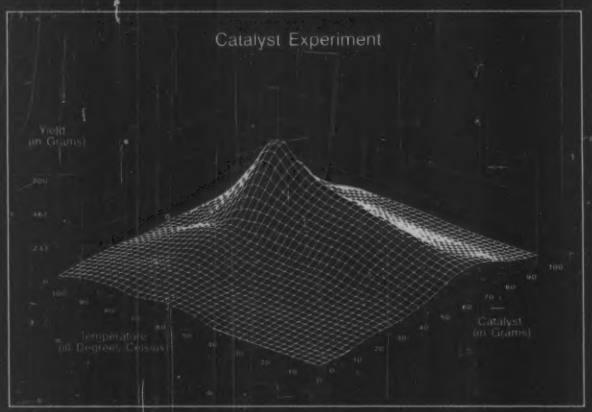

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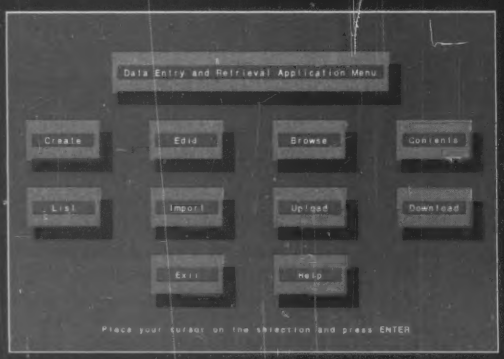

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Rough seas predicted as Agenda ships

BY ALAN J. RYAN
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp.'s Agenda, which the company claimed creates a new software category called "personal information manager," met with mixed reviews last week.

At a gathering held to announce shipment of the $395 product last week, Lotus had 10 beta-test users on hand to tout the product, show proprietary applications and announce some Agenda aftermarket products.

Agenda reportedly will allow users to enter free-form information as they get it, such as notes, ideas, action lists, messages, reminders, contacts, addresses and schedules. Once the data is entered into the personal computer, users organize it by assigning it to one or more categories they have created. They can then look at the information from multiple perspectives through user-defined views.

While organizing personal information is the target of Agenda, it has been put to other corporate uses as well. In its beta-test version, it has categorized news-wire articles at the Royal Bank of Canada in Toronto; First Interstate Bancorp in Los Angeles put it to work as an archiving system for electronic mail messages.

Voices of dissent

Still, some analysts expressed skepticism about the product making a significant dent in the marketplace. Some of the reasons cited include the following:

- The Agenda capabilities are useful and address real problems of handling free-form text but would prove more useful if they were integrated into other products, such as relational data bases.

Richard Finkelstein, president of Performance Computing, Inc. in Chicago, said that sales representatives might be drawn to Agenda to keep track of their free-form text, but if they wanted to incorporate that same information at the same time into their customer list data bases, they would be out of luck.

- Users who spend too much time constantly updating Agenda may find themselves less productive at work.
- The product creates an overlap with some other Lotus offerings. Lotus is setting itself up to be "competitive with its own data base line; there is going to be a certain amount of overlap," one analyst said, adding that many users put text into their data bases and spreadsheets as well.
- Marketing the product will be difficult. Lotus's attitude is, "Trust us; we're Lotus. We can't tell you what it is, but try it," said Nancy McSharry, a senior PC analyst at International Data Corp. in Framingham, Mass. "They don't have a focused marketing strategy for this."
- Agenda may realize a fairly substantial following at the onset but could lose its charm for users. With Agenda, McSharry said, users can put all the notes on their desks into their computers. But if they wanted to take the notes out of the office, they would need a portable computer.

Prime user sues for $100M

BY CLINTON WILDER
CW STAFF

TAMPA, Fla. — A user of a Prime Computer, Inc. 9750 minicomputer is seeking $100 million in punitive damages from Prime because the system allegedly failed to meet his needs as promised by the vendor.

Richard Mulholland, an attorney and principal at law firm Richard Mulholland & Associates, based here, further charged that Prime knew the 9750 was inadequate for his site when it leased the $300,000 system to him in September 1985. Mulholland said his office still uses the computer but that it can support only the most basic office automation applications and runs at a snail's pace.

The largest award ever won by a plaintiff in a computer user suit is approximately $6 million. This was awarded to Madonna Construction Co. in San Luis Obispo, Calif., by NCR Corp. [CW, Aug. 10, 1987]. Mulholland said he filed for $100 million "to try and prevent [Prime] from doing this to other people."

"That's a staggering sum," said Norman Cohen, an Atlanta-based computer litigation consultant who has advised several users in suits against NCR. "Usually there is some reasonable ratio between punitive damages and the actual damages suffered. This may be a strategy to get the vendor to the bargaining table."

A spokeswoman for Natick, Mass.-based Prime said the company does not comment on legal cases in which it is involved.

Mulholland charged that Prime misrepresented the 9750's capabilities both to him and to a consultant he hired to draw up specifications for the computer needs of his firm. Mulholland said he hoped to automate on a law office management software system he had designed; he claimed the 9750 could not support his software.

No trial date has been set.

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EDITORIAL

Fair trade

IT TOOK A WHILE to come up with the right ingredients, but the U.S. House of Representatives has finally cooked up a version of the omnibus trade bill that even President Reagan may find palatable.

Included in the bill — in addition to some pork-barrel agricultural tidbits — are all sorts of goodies that, judiciously used, should further the cause of U.S. businesses trying to compete head-to-head in international markets.

The landmark bill's likely approval signals the intent of the government to get somewhat serious about the growing national dilemma of a phenomenal trade imbalance, particularly with our Far East partners. It harkens to a policy made famous nearly a century ago by Teddy Roosevelt: Carry a big stick. In this case, the big stick will be the threat of presidential actions to close off the most lucrative marketplace in the world to those countries whom we feel aren't playing fair. While no one is going to argue with the bill's intent, we must not lose sight of the dynamics that got us into this mess. The fact is we lost our competitive edge in many key markets because we were out-competed, not because the Japanese or the Koreans or the West Germans were cheating.

In the computer business, the U.S. has maintained its dominant worldwide position with superior products and superior marketing. And in Japan, the U.S. computer companies that have been successful, like IBM, marketed their wares like Japanese companies. Others, like DEC, didn't take time to learn the culture and have been very unsuccessful. That is to say, the success — or failure — formulas abroad are not always as complex as some make them out to be.

So while we applaud the intent of the trade bill, we urge extreme caution in not turning it into yet another stupid excuse for the inability or unwillingness of some to play a global game with global stakes.

'Downtime'

"It was a computer error."

In this age, those poor, brainless hunks are blamed for everything from incorrect phone bills to credit errors to the stock market crash of October 1987.

Now, as the evidence mounts, it seems the most sophisticated computer afloat will take the heat for gunning down a commercial airliner. Only this time, it's not someone's credit or some money that's lost but the lives of 290 people.

Of the many lessons to be learned from last month's tragedy, perhaps the most important lesson is that we can never take too many precautions with the faith we put in the machines we create, be they on Wall Street or in the Persian Gulf. There simply are some things no machine can be entrusted to do, and compensating for our human foibles is one.

LETTERS TO THE EDITOR

Stick to computers

Your June 20 issue disappointed me. When I am interested in reading about liberal or conservative moralistic views on South Africa, I turn to the daily edition of the *New York Times* or *Wall Street Journal*. It is more than enough. Please stick to information systems and telecommunications issues and eliminate your personal political beliefs relative to one of many countries that does not measure up to our own. Editorializing in your publication on such a controversial issue is a no-win situation.

William H. Elder
Corporate Director
Information Systems Management
Allied Signal Corp.
Morristown, N.J.

A plug for ASM

I found the Executive Report on MIS education [CW, May 16] to be quite interesting. However, I was disappointed that no mention of the Association for Systems Management (ASM) was made.

ASM's raison d'etre is the education of information systems professionals. This goal has not changed in 41 years since the association was founded in 1947.

ASM's dedication to the professional advancement of the MIS person is not limited to seminars. ASM's publications department publishes a variety of books on systems topics as well as the monthly *Journal of Systems Management*.

Bernie Thiel
Director of Public Communications
Association for Systems Management
Cleveland

In search of . . .

I am seeking information about other sites who use Northern Telecom, Inc.'s Meridian DV1 telephone and data system.

Unlike the SL1, there do not seem to be many such sites in the Southern California area, and where there are, there is a great deal of vendor jealousy and lack of solid knowledge about the system. Several of the sites I have spoken with seem interested in some type of users group or newsletter. Perhaps a professional network could be established among managers of DV1 systems around the nation.

It is a good base system that ties all our phones together and provides not only a Northern Telecom Unix environment but also a means of connecting to a Novell, Inc. network. We would benefit from knowing what others are doing with their systems.

Nicolas L. Behrmann
Director of Information Systems
Heart Institute of the Desert at Eisenhower Medical Center
Rancho Mirage, Calif.

Provides a choice

The next logical product for a financially flush developer like Microsoft Corp. would have been an efficient DOS-based multiuser operating system — the very product IBM fears most.

IBM has successfully diverted the resources of Microsoft toward IBM's goal of a "we are the lords — you are the serfs" microcomputer user community. With the tremendous investment demanded by IBM, it is inconceivable that Microsoft would squeak without prior approval from IBM.

Perhaps Unix will become the multiuser choice for users who refuse to allow themselves to become subject to the artificial, self-serving limitations of a single-vendor environment.

Ralph Richards
Germantown, Wis.

Taking control

Charles Lecht thinks centralized computer voting systems will revitalize interest in voting [CW, May 16]. If that is fact, Lecht mistakes the cause of voter apathy for its solution.

It is the large-scale anonymous systems that account for the lack of participation in what is left of the democratic process. People do not vote not because it is inconvenient but because they correctly observe that most decisions have been removed from the realm where their involvement has an impact.

Ironically, computers can play a part in the development of a grassroots, participatory democracy. This is not by channeling votes toward the center but by providing access to information so people can take control of decisions that affect their lives.

Decentralized voting allows for minor mischief in local areas. A centralized system could open the door to manipulations on the national level that could be calamitous.

Daniel A. Coleman
Data Processing Manager
The Village Companies
Chapel Hill, N.C.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Reading between the lines

It'd be amusing to see Jackie Collins try her hand at romancing the clone

ASHLEY GRAYSON

Has anyone noticed that despite the large number of computer books on bookstore shelves, it is still difficult to find informative, readily useful books on the hottest topics today?

Historically, publishing has sought to inform and educate the public by delivering crisp, insightful volumes usually written by authors with both experience in the topic and writing skills. Although publishers would like to continue this tradition, computer books are different.

A few years ago, the business of publishing books about computers boomed. With Adam Osborne's book on microcomputers and a few titles explaining Micropro International's Wordstar, the market took off.

The early authors and publishers were part of the fledgling microcomputer industry and wrote — often poorly — from direct experience. Demand for content and volume far exceeded their ability to supply material. Enter the "big-time" publishers.

The publishing giants know a lot about killing a boom with mass production techniques.

Grayson is the founder of ADG, a San Pedro, Calif.-based organization that develops sales tools and programs for high-technology companies.

About the time computer books were ramping up, contemporary romances were crashing. These paperback novels sold half a million copies each per month when six to 12 titles were available.

Publishers jumped on the market opportunity. After three years of ramping up production, 90 individual titles were being released every month with sales of 20,000 copies each.

Vicious circle

A similar crunch happened to computer books. Early paperbacks sold by the thousands at $16 to $30 each and attracted the same publishing giants to first glut and then kill the market.

First they flooded the low-end market with books for beginners that did little to educate the reader.

Then they failed to notice that readers could not be expected to buy multiple books on Basic in the same way a mystery reader will seek out new mysteries.

Overall, many professional writers with no relevant experience were drawn in to develop titles. As a result, sales collapsed. In addition to the readers' sheer inability to consume a high volume of the product, computer books have two other production difficulties.

First, there are few experts around. In order to be current, many computer books must be written in advance of the systems they describe. They are thrown together quickly by writers who don't have the luxury of reflecting on the best way to present the material.

Second, there are few name authors. Fiction book buyers typically follow an author's work, so publishers love writers like Louis L'Amour and Jackie Collins; their sales are predictable.

It's not the same with computer books. Just because Joe Smith's book on Wordperfect was great doesn't sell his next insight into Microsoft Word. An entirely new audience must be found.

Today, more than 90% of the computer books published are aftermarket products whose potential market is tied directly to the success of the software or hardware product they supplement.

Supplement may not actually be the right word. In the early days, product-specific computer books were a valuable addition to the developer's inadequate manuals. Often these execrable documents were written by techies for other techies and were incomprehensible to even the interested and motivated user.

Just as frequently, the book buyer held a pirated copy of the software and used the commercial book as a principal reference. Books provided improved readability and organization.

This trend, however, has reversed. Vendor documentation has improved dramatically in concept, presentation and quality of writing. Trade computer books have become "derivative works," often just restating in more — not necessarily better — words the facts in the product manuals.

Thus, computer books are to their products what movie novelizations are to films — souvenirs of the product.

Market research indicates that a potential market of 1.2 books worth approximately $20 will be purchased for every $295 product sold. In order to be more than a rehash of the vendor's manual, books need a hook.

PAUL MEISEL

Many trade computer books attempt to enrich the reader's understanding of a product or application by being user-friendly. All too often this effort desolves into excruciating natter to the reader.

Here are some suggestions for computer book shoppers:

- Don't expect to find books that will inform you of trends or help you choose among alternatives such as Xerox's Ventura Publisher vs. Aldus's Pagemaker. Publishers believe books are aftermarket products you buy after you've purchased a particular system.
- If you are seeking a supplement for vendors' manuals, take the manuals with you to the bookstore. Compare them with the available titles to determine whether the books enhance or restate the material.
- In general, formulate a specific statement of what is inadequate about the vendor's literature before seeking a supplement. Scan the text for crisp descriptions as opposed to nattering diatribes to the reader.
- You don't want to have to spend extra hours pulling information from a massive tome that has been diluted with extra writing. Estimate the information per pound included in the book.
- Finally, is the book thick because of the quality of organization and information or to justify a large price tag?

Is all that training worth a wallop on the wallet?

READER'S PLATFORM

ROBERT HARGROVE

Once a year, around budget time, one question seems to reappear, asked with some exasperation by the MIS director of the person charged with providing training: "We spent thousands of dollars last year for training. Did we get our money's worth?"

Implicit in this question is, "Prove it."

Training justification these days seems to have fallen on hard times as traditional topics — Cobol, JCL, VSAM and CICS — are supplanted by vendor-specific code generators, off-the-shelf financial packages that are difficult to maintain, decision support systems and other productivity tools for which the audience may not necessarily have a built-in frame of reference.

Hargrove is security and contingency planner at the University of Texas's Health Science Center at Houston.

Indeed, the trainee may have to unlearn some traditional data processing notions, for example: "Just put the X in column 19, don't worry about the logic."

The idea that the company spent megabucks on training last year and everybody's not yet functioning as needed might frustrate managers, but it also emphasizes their neglected role in the process.

For instance, departmental superstars are sometimes exempted from training in a new technology because they are too busy on a hot project that is already months behind schedule. Instead, expendable employees are sent. This action not only may frustrate the superstars, who see the new technology pass them by, but also may deprive the department of nourishing technology champions.

The timeliness of training is also important. Sending students to a class in January for an application that won't get started until June wastes resources and emphasizes the highly perishable nature of training, which perhaps should be date-stamped, like yogurt: "For best results, use the contents of this course within 30 days."

> PERHAPS training should be date-stamped, like yogurt: "For best results, use the contents of this course within 30 days."

These problems can be further exacerbated by managers from the "Only Wimps Need Manuals" school — those individuals who learned Cobol by candlelight and see on-the-job training as the only true way to learn. Although hands-on learning has some merit, a course can formalize the training, ensure that the technology is used efficiently and enforce company standards.

Management's frustration can be understood in light of expectations that have risen, producing needs that are still unmet. For example, a vendor may sell management a productivity tool largely on the basis of ease of use, with little or no mention of the training needed to use it effectively.

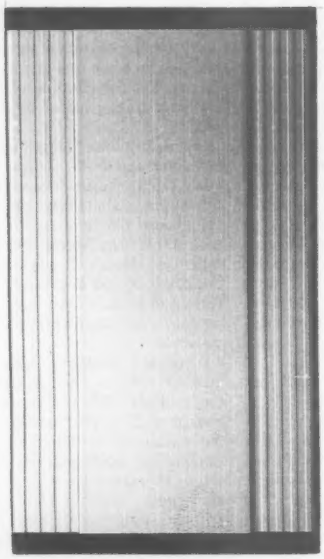
And there are the television commercials. One presents a manager being berated by her boss for buying a system that is unproductive because of the extensive training required. Another office has bought the sponsor's product, which is so easy to operate that the users can virtually train themselves.

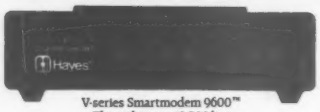
IBM used a commercial hook with *The Little Tramp*, who was bewildered by the machines in modern times, and then it used *M*A*S*H's* Frank Burns, who couldn't tell a femur from a fedora, to imply how easy its systems work. Presenting these two as masters of technology de-emphasizes any need for training.

Training, too, has often been viewed as just another black hole, an overhead item whose measurement of effectiveness and contribution to the bottom line has always been specious at best. Contributing to this overhead idea is the use of training as a perk — the idea that a job well done might merit a class out of town, regardless of whether it could be taken locally.

One of the first ways to change the attitude toward training is to make it an integral part of a person's job, not an ad hoc or as-needed procedure. Hit-and-run training usually leaves the students feeling just that way. Managers should encourage each other, as well as their staff, to participate in professional organizations in order to further their growth. Joining these groups offers excellent exposure to new ideas, and it costs comparatively little.

Still, training is no panacea. It is simply a tool that, if managed properly, can attain a rare status — a perk that contributes to the bottom line.





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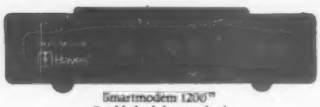

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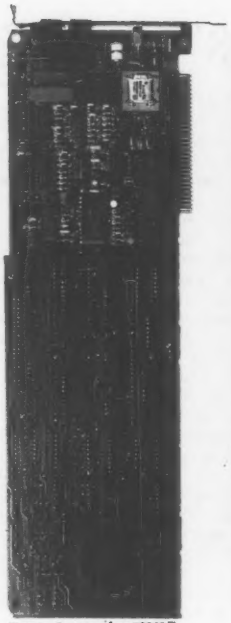

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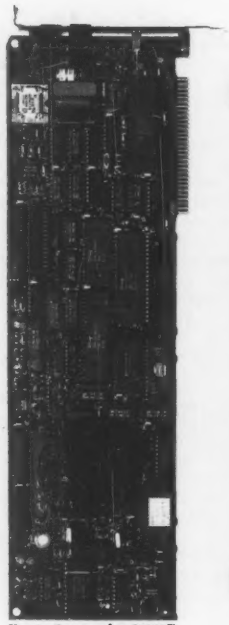

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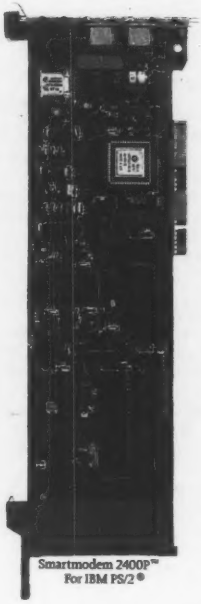

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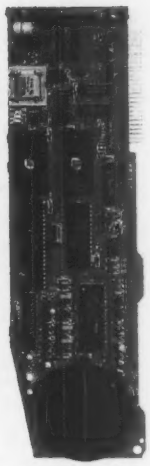

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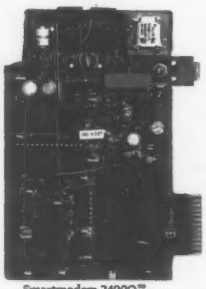

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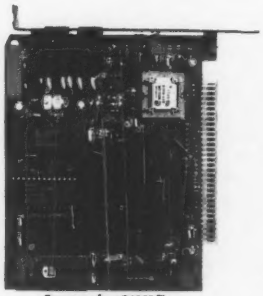

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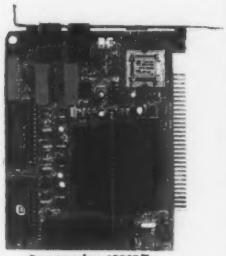

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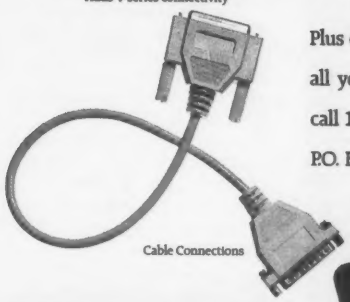

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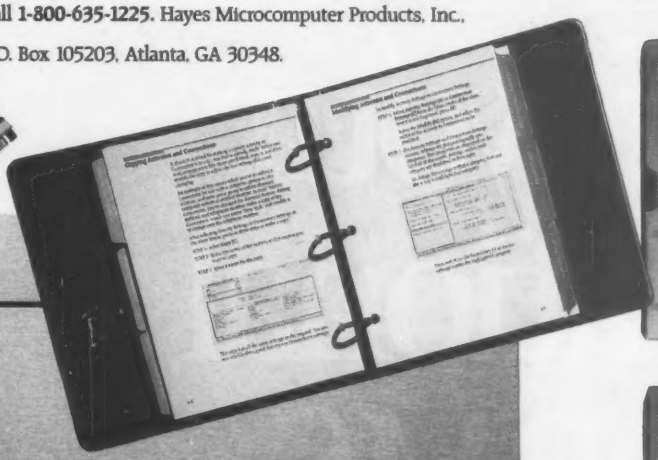

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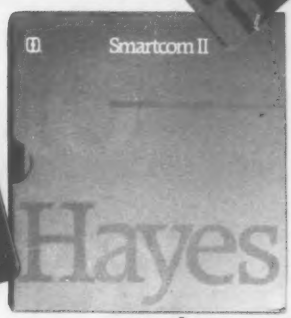

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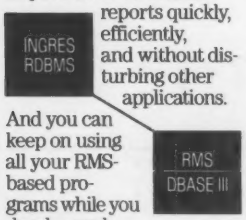

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HARD TALK

Stanley Gibson

Do standards sap vitality?

Are we all about to settle in behind the wheel of a Russian truck?

Maybe, and it won't have anything to do with Gorbachevian *glasnost*. Before long, you will be able to head down to OSF Motors, where a little beauty will await you, ready for a test drive. What Ken Olsen, president and chief executive officer of DEC, once termed the equivalent in engineering virtuosity of a Russian truck — a standard computing platform — is now on the drawing boards of systems engineers.

Indeed, the current hysteria over standards makes it seem like it won't be long before there is industry-standard software in every disk drive — similar to having a Russian truck in every garage.

To hear some tell it, whether we like it or not, we are all chained in lockstep march to standards and there is no turning back. We are without a doubt headed for a time when the computer equivalents of Ferraris and BMWs will be standardized and packaged beyond recognition, their individuality stamped out of them. You will

Continued on page 31

Teradata claims 4-to-1 speed edge over DB2

BY SALLY CUSACK
CW STAFF

Teradata Corp. last week announced the DBC/1012 Model 3, its next-generation data base machine that delivers a reported 4-to-1 price/performance advantage over IBM's DB2 Version 2.

Teradata is aiming the new Intel Corp. 80386-based processor at applications requiring very large data bases. The relational data base machines were designed to swiftly process SQL queries using multiple CPUs in parallel and are often dedicated to a particular task, such as credit authorizations, as opposed to general-purpose mainframe software such as IBM's SQL/DS and DB2.

Last month, Teradata announced a benchmark of 1,176 transaction/sec. for simple credit authorization transactions run on its DBC/1012 Model 2. The Model 3, which has the same configuration, will reportedly achieve 2,492 transaction/sec. with subsecond response time, 2½ times faster than the Model 2.

The Teradata relational machine currently interfaces with Applied Data Research, Inc.'s Datacom/DB and Software AG of North America, Inc.'s Adabas.

Teradata spokesmen said the company plans to give DB2 and SQL/DS customers the option of querying a Teradata data base from within IBM's Query Management Facility in the fourth quarter of this year.

The Model 3 was also designed to integrate with users' existing Teradata processors, according to Ben Barnes, Teradata's director of marketing. The Model 3 processor subsystem allows the previous Model 2s to be housed in the same chas-

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- Computers aid the oil industry. Page 25.
- Big Boom Part II: Full-text retrieval. Page 25.
- NCR has a basketful of new products. Page 25.
- Boole & Babbage pulls curtain from DB2. Page 27.
- Gould releases supermini. Page 32.
- Wollongong gives Unix 4.3 to VAX/VMS. Page 33.

FEC picks VAX as running mate

ON SITE

BY KELLY SHEA
CW STAFF

On such does the fate of a great nation rest: a Digital Equipment Corp. VAX-11/750 connected to a service bureau in New Jersey.

That VAX — located in the data center of the Federal Election Commission (FEC) in Washington, D.C. — and another remote VAX in the Garden State run the programs that help ensure that presidential candidates comply with election laws.

And with a touch Thomas Jefferson would appreciate, the systems are set up so that a citizen with a personal computer and a modem can, for a modest access fee, peruse a copy of the commission's data base, checking to see that no candidate or committee crosses the line of legality.

This summer and fall, as happens every four years, the VAXs will buzz and whir at an especially frenzied pace, trying to keep up with the demand brought on by the presidential election.

Formed in 1975 in the wake of Watergate's excesses, the FEC is responsible for accepting and auditing the financial reports and filing statements of candidacy from anyone running for federal office — the House of Representatives, the Senate or the presidency.

Also, the commission administers the presidential matching fund and enforces campaign finance laws for federal elections. The work is constant, whether it is a federal election year or not, but it is busiest these days.

One of the daily jobs of the FEC's Data Systems Development Division (DSDD) is to document the campaign contributions reported by candidates and political action committees.

"We are the point of entry for the majority of the filings," says Richard Hooper, director of the DSDD. While the documents for U.S. representatives and senators are reported to the House and Senate and then forwarded

Continued on page 30

SUSAN STEINKAMP/PICTURE GROUP

DSDD's Hooper *and VAX play role in presidential election.*

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SOFT TALK

Brenda D. Lewis

Copyright issue blurs

Now is not the time for software writers to be lax about protecting their software.

On June 3, the U.S. Copyright Office rendered its decision on whether two copyright registrations were necessary to protect program — or source and object — code and audiovisual display. The verdict stated that one copyright registration would protect the screen display as well as the code that generated it.

However, if a specific reference to a screen display is mentioned in the application, the applicant must deposit a visual or audiovisual copy of the display.

The Copyright Office left it to the courts to determine the scope of copyright protection. But until now, the courts have rendered diverse opinions on screen displays.

One recent decision, handed down in *Digital Communications Associates, Inc.* v. *Softklone Distributing Corp.*, is at odds with the Copyright Office's policy.

In effect, the court held that screen displays need a separate copyright registration in order to have copyright protection.

Since the Copyright Office has made the determination that screen displays are protected, the major question is, What test will the courts use to detect copyright infringement?

Continued on page 29

Systems speed search for oil via modeling

BY NELL MARGOLIS
CW STAFF

Nobody needs another acronym — but everybody in the embattled U.S. oil industry needs CAEX.

Computer-aided exploration, or CAEX, is a growing body of large-volume, complex seismic and geological data modeling and analysis software and the high-speed interactive graphics and image-processing hardware that supports it.

It is a down-to-earth industry niche in more ways than one, according to Richard D. Schwarz, a technology analyst at Shearson Lehman Hutton, Inc. in New York.

It works for them

"If you think people are paying for this stuff because they've got lots of spare time lying around and it's such whiz-bang technology, you're way off base," Schwarz said. The oil geologists and explorationists, whose needs are seen fueling the CAEX market to an anticipated $1 billion by the 1990s, "aren't computer jockeys who are going to get into specmanship with you; they're professionals who are highly sophisticated in oil but not in technology. They're going to judge the hardware and the software entirely by how it works for them."

What explorationists need from the technology is a way to hedge their bets about where to find oil. An awesome array of obstacles are currently ranged against them.

For starters, according to a white paper published by Digital Equipment Corp., "New oil fields are smaller, harder to find and located in harsh environments, such as the Arctic or open ocean." Human resources are drying up as well: A recent consulting firm survey cited by DEC reported oil company work force cutbacks of up to 30%, with the deepest cuts occurring in exploration and production.

Six of seven holes drilled in 1985 were dry, reported the keynote speaker at the June 1986 Association of Exploration Geophysicists meeting; five of the six misses were the direct result of insufficient interpretive detail. According to *Pipeline & Gas Journal*, the average cost of drilling a hole is $5.4 million.

If one $5.4 million mistake is unaffordable, $27 million wasted out of every $37.8 million spent is unthinkable.

What is more, the sheer amount of seismic data that must be analyzed to best estimate where to drill a well is staggering. According to Landmark Graphics Corp., a 4-year-old dedicated CAEX company based in Houston, a traditional, or two-dimensional, seismic survey can produce thousands of units of data per cubic survey mile; newer survey techniques that provide a three-dimensional snapshot of the earth's surface can yield as many as a million units.

On-site solution

Until recently, said David Mitchell, senior geophysical specialist at Houston-based Tenneco Oil

Continued on page 31

Boom times expected for text retrieval

BY NELL MARGOLIS
CW STAFF

Though far from dogs today, full-text retrieval systems, by 1992, are going to emerge as golden retrievers, according to a recent research report.

"A Statistical Analysis: Full-Text Retrieval Systems, 1987-1992," published by Framingham, Mass.-based market research firm International Data Corp. (IDC), forecasts a bull market for hardware and software that lets users summon any word or string of words from text data bases and large document collections without being tied to key words and key word indexes.

And we are already on the threshold of part of the boom: With the worldwide full-text retrieval market expected to swell from last year's $83.9 million to almost $680 million by 1992, according to the report, the greatest growth rates should take place between this year and next.

Jet propulsion

A number of factors are cited as fueling the explosion in a market that, until recently, was limited to users such as major law firms and the government by intensive CPU and storage demands. Prime among these are the arrival of high-power microcomputers, dropping hardware and storage prices, rising memory and storage capacities and improved algorithms underlying easier to use, less costly text-handling software.

In the study, IDC segmented the full-text retrieval by hardware platform and defined platforms by the number of users. Thus, large-scale systems are those with more than 128 users per system; medium-scale, 17 to 128 users; and small-scale systems and personal computers, one to 16 users. Healthy growth is predicted across the system spectrum but particularly in the middle, where the increasingly attractive storage, power and central management capabilities of minicomputers and servers are seen fueling an 84.2% compound annual growth worldwide, reflecting a 67.2% revenue leap.

Key to the market's overall growth are PC-based systems, currently the fastest growing segment but expected to slow to an overall average growth rate

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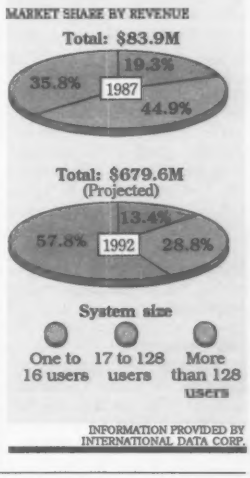
Boom for retrieval

Lower prices, higher technology and integration into office systems to fuel full-text retrieval explosion



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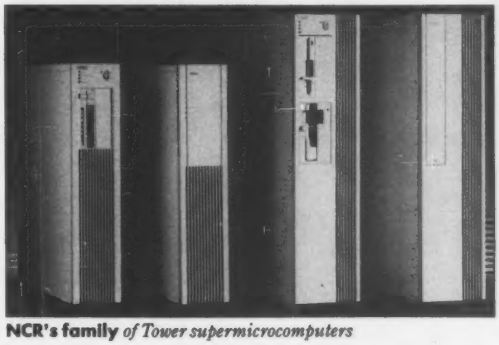
Something old, new found at NCR

BY JEAN S. BOZMAN
CW STAFF

DAYTON, Ohio — Building on a product base that has a solid following in key markets, NCR Corp. will be content to tweak its existing processor line during the next few years rather than overhaul it dramatically.

Nonetheless, a basketful of new products and enhancements are waiting in the wings, ranging from personal computers and scientific workstations to high-end transaction processors and mainframe software. An outline of product changes emerged from a series of interviews with senior NCR executives earlier this month. Among the highlights were the following:

- A series of high-end NCR 9800 transaction processors, which the company says may debut this fall [CW, July 11]. The machines would bridge the gap between the existing 9800 machines and the top-of-the-line NCR 8800 mainframes. Along with new hardware, NCR said it expects to ship a transaction processing monitor, a relational data base package and a communications manager. These moves will come after a major foray into mainstream transaction processing by Digital Equipment Corp., expected this week.
- A series of workstations, aimed at the scientific/engineering and technical marketplace.



NCR's family *of Tower supermicrocomputers*

While no specific date was given for the introduction, industry sources said some models could be introduced this fall. NCR executives said they expect to be a major factor in the high-end workstation marketplace by 1991.

The planned workstations are said to feature high-resolution graphics, computer-aided design and manufacturing packages and high-capacity disk drives. The price tag could be between $10,000 and $25,000.

- A series of enhanced workstations, intended as replacements for IBM 3270 terminals, is to be introduced during the next two years. The workstations, priced from $1,000 to $3,000, would add industry-specific functionality to low-end terminals. Examples include airline reservations terminals and units used to process insurance claims.

The gradual evolution of the company's product line will include adding state-of-the-art microprocessors, such as the Intel Corp. 80486 chip and NCR's own 32-bit very large-scale integration chips, to existing products, company officials said.

This trend will tend to make NCR products more compact and allow them to be used primarily as distributed processors outside the computer room. The NCR computers that will stay in MIS glasshouses will include the high-end NCR 9800 transaction processors and NCR 8000 series large-scale mainframes.

In the mid-range, users will have the choice of using the Unix-based Tower computers or the NCR-proprietary ITX machines, including the older NCR 9300 and 9400 machines and the NCR 10,000 line.

Native Unix will be intended for the sophisticated user, and ITX will be aimed at users who may not have extensive systems resources, said Robert C. James, vice-president of product mar-

Continued on page 28

LynxOS thwarts Unix time-sharing

BY J. A. SAVAGE
CW STAFF

CAMPBELL, Calif. — An operating system said to be 90% compatible with AT&T's Unix System V has been designed around real-time capabilities useful in manufacturing, as opposed to Unix's time-sharing approach.

Lynx Real-Time Systems, Inc. claimed its operating system, LynxOS, supports real-time applications in areas such as process control, robotics and data collection. Additionally, the company said the operating system has a prioritizing mechanism built into the software.

Lynx was able to do this, according to President Inder Singh, because the operating system was developed in a clean room environment with no help from AT&T's Unix source code. This approach was taken to create a real-time system that would not be restricted by the inherent Unix time-sharing properties.

Even without paying license fees to AT&T, however, users will not get any discounts. The source code license fee is $65,000, which is the same as the price of AT&T's Unix System V, Release 3. And as with AT&T, additional copies are priced at $20,000.

Lynx is first offering the operating system on its own Motorola, Inc. 68010 processor-based computer.

User nightmare

Not everyone welcomed a Unix substitute. "It's been a disaster for users. The world has been consolidating behind Unix System V and [the University of California at Berkeley's Unix 4.2]," said Bill Keating, a software marketing manager at Sun Microsystems, Inc.

Keating called the Lynx announcement a threat to software developers, as it forced them to port applications to another system, and simultaneously poohpoohed its chance of gaining market share. An AT&T spokesman said the offering "doesn't appear highly unusual."

Singh, who founded Excelan, Inc., said the operating system should run 90% of existing Unix applications. He said he has tested 30 or 40 applications and all of them ran.

One or the other

"A number of companies have built real-time extensions to Unix, but they're either real-time systems or Unix systems — not both," said Tony Friscia, president of Salem, Mass.-based Advanced Manufacturing Research, Inc.

As one of the few analysts who has actually seen LynxOS demonstrated, Friscia said he thinks it will find a home in manufacturing. "Real-time has to be fast enough to meet applications needs. In a nuclear power plant, it would be nanoseconds. In a brewery, real-time might be a day."

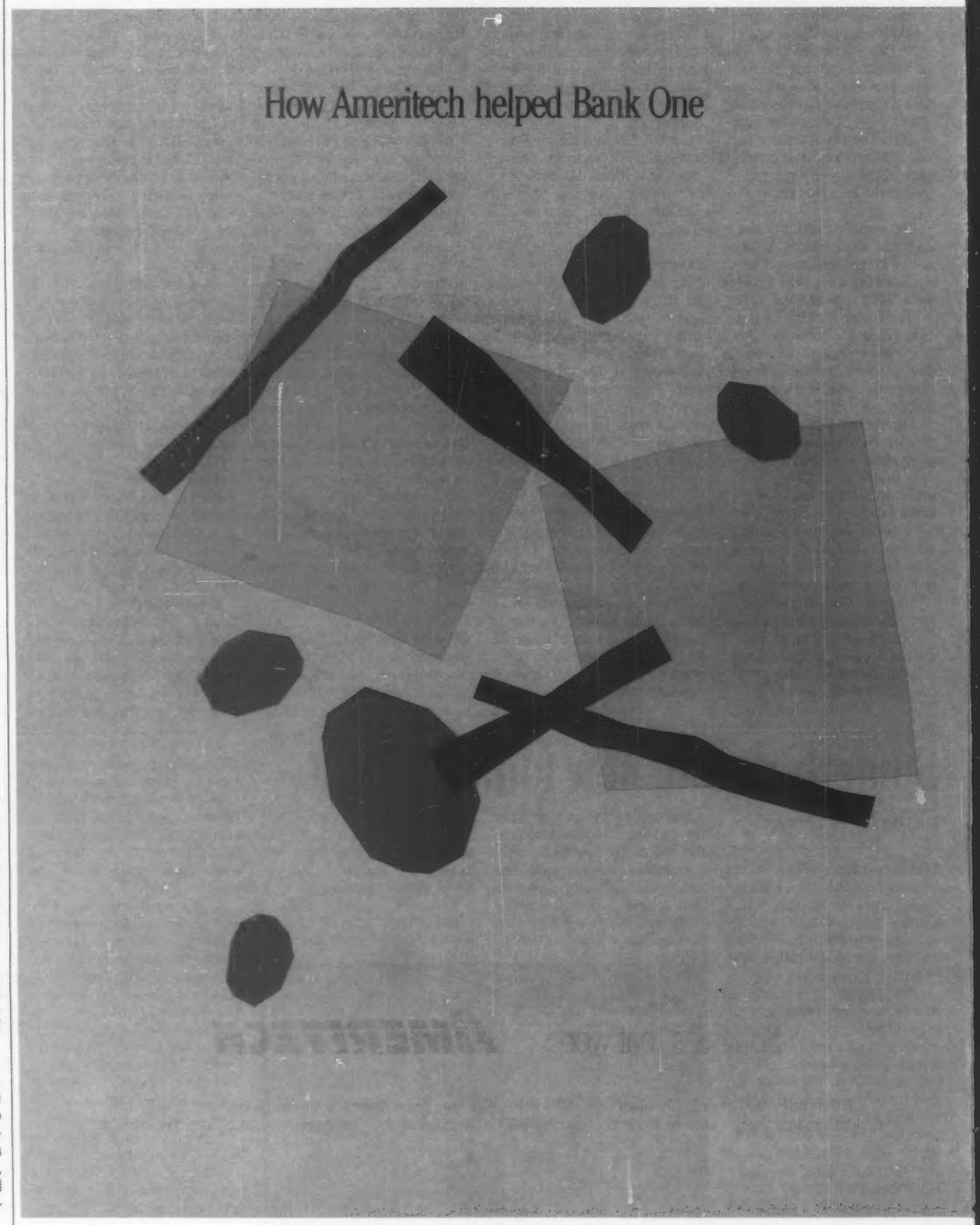
Lynx provides real-time in a shared-time system by prioritizing tasks and preemptive scheduling, according to the company. The highest priority task that is not waiting for resource usage or I/O is able to use the CPU. Tasks with the same priority are time-sliced. There can be a maximum of 32 job priorities.

Some analysts have said they think LynxOS has an advantage in real time because it was built without being based on AT&T's Unix, with its inherent non-real-time characteristic.

"The other people [Unix-like developers] are fixing what's hard to fix," said Greg Cline, an analyst at The Yankee Group.

Some analysts' immediate reaction to the LynxOS was that it could not be Unix-compatible without using AT&T's source code and indicated that the company may be in hot legal waters. "Anyone can look at the code itself and see it is very different," Singh said.

A spokesman for AT&T said its lawyers were not concerned at this point.



Firm unleashes IBM DB2 watchdog

BY NELL MARGOLIS
CW STAFF

SUNNYVALE, Calif. — Performance management maven Boole & Babbage, Inc. is extending its multisystem architecture to give system operators and data base administrators insight into the workings of IBM's DB2.

Slated to be available in the first quarter of 1989, DB2 Manager is a stand-alone, on-line performance monitor and exception notification software package for the IBM MVS environment.

"IBM has not provided a route to real-time information about what's happening within your DB2 system; they only give you off-line, batch-oriented analysis tools," said Judy Quenet, Boole & Babbage's DB2 Manager development supervisor.

One problem with DB2 is that a user may make what he thinks is a simple call, but that easy-to-write call may cause a lot more work inside the system than he suspects, she said.

With the Boole & Babbage performance monitor, according to Quenet, inadvertent system-hogging should become less of a problem.

The software warns the user of any exceptional DB2 activity, including work loads that are exceeding thread capacity and causing a waiting line to form, shortages of critical resources — such as the 32K buffer pool — and potential or actual lock contention.

Problem solver

While the ability to monitor DB2 activity is not unique to Boole & Babbage, an important aspect of DB2 Manager is. Because the product is fully compatible with the company's automation and performance management offerings across multiple CPUs and multiple sites, the user may isolate the source of a problem or potential problem regardless of where it resides in the overall system, Quenet said.

"Typically," she added, "people run a lot more than one DB2 system — and they have them on different CPUs and in different locations. You really need that integration to get the total picture."

DB2 Manager will be priced from $25,000 to $40,000, based on site configuration, Quenet said.

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HARD BITS

Masscomp's $10M pact tactical coup

Massachusetts Computer Corp., or Masscomp, based in Westford, Mass., recently signed a $10 million contract with Lockheed Missiles & Space Co. in Austin, Texas. The contract calls for a minimum of 72 of Masscomp's 6000 series Unix-based real-time systems. The 6000 line was announced in March. Lockheed will incorporate the computer systems in the U.S. Naval Warfare Command's Tactical Environmental Support System. The contract is slated to run through 1992.

Encore Computer Corp. recently signed a three-year, $21 million contract with **Disc Computer Systems, Pty. Ltd.** in Australia to be the exclusive distributor in that country of Encore's Multimax 310 and 320 parallel processers. Encore said it has an installed base in Australia worth $2 million. One system is at the Royal Melbourne Institute of Technology.

Sun Microsystems, Inc. announced that Ital Business Computer Systems Ltd. will resell Sun's 386I line of workstations in conjunction with Autodesk, Inc.'s Autocad and Autosolid software in Southern California.

Ital is an authorized value-added reseller for IBM, Compaq Computer Corp. and Sun and is an authorized dealer for NEC Information Systems, Inc., N.C. Microproducts and Autodesk.

NCR

CONTINUED FROM PAGE 25

keting and support at NCR's U.S. Data Processing Group.

Many ITX systems users have fewer than 10 data processing professionals on staff and hardly have the time to write custom applications. Typically, an ITX machine will be sold in conjunction with an application to a small shop, James said.

Consequently, the ITX-based systems will be going head-to-head with IBM's recently announced Application System/400 family of processors, NCR officials admitted.

In the area of PCs, NCR said it plans to keep current with all IBM Personal System/2 features — including the OS/2 relational data base, the Communications Manager and the icon-based Presentation Manager. Icon-driven menus will be common within two years, NCR executives said. Later, NCR said, it plans to ship object-oriented data bases that store images, text and voice information in the same disk drive.

NCR is fragmenting its PC line into three major areas: general-purpose PCs, low-end intelligent terminals and high-end workstations.

By 1991, NCR plans to base its high-end workstations on the 80486. General-purpose PCs will then use the Intel 80386, for the most part. Use of the Intel 80286 — now the engine for most NCR PCs — will be shifted to low-end PCs or discontinued.

As a worldwide supplier of systems, NCR has pledged to continue to support international standards, including Open Systems Interconnect and Manufacturing Automation Protocol/Technical and Office Protocol. "I want to provide a complete suite of OSI interconnect products as well as a suite of products that will connect to the IBM world and the DEC VAX world," Yates commented.

Looking to the future, NCR said it expects to unveil a series of Integrated Services Digital Network products by 1991.

Boom times

CONTINUED FROM PAGE 25

of 60% in the five-year period covered by IDC. Not only are small-scale systems the particular beneficiaries of the factors driving the market as a whole, but also, this segment provides a large new class of users with a migration path to medium- and large-scale text retrieval.

Growth spurt

A whopping 51% average five-year growth rate is expected in the large-scale systems category, largely on the basis of impending enhancements of IBM's somewhat played-out Stairs product; the advances will let users layer Stairs on top of DB2 and SQL/DS, according to IDC.

Whatever the platform, the players most likely to score in the suddenly swift text retrieval game are those whose products integrate with standard business tools such as data bases, word processing packages and office automation software, IDC predicted.

Even now, the IDC report said, its surveys are showing the general office user to be the third most frequent buyer of full-text retrieval products, behind law firms and the government.

SOFTWARE NOTES

Acquiring minds would like to know

In an acquisition that it has managed to keep quiet so far, **On-Line Software International, Inc.** recently purchased two IBM DB2 utilities, DB/Pro Edit and DB/Clist, from **Updata Software Co.** in Holmdel, N.J.

Updata Chairman Barry Goldsmith has shown a knack for selling off successful product lines, having allowed Duquesne Systems, Inc. to acquire the firm's Single Image Software line in 1986. Goldsmith earlier sold the Top Secret security package to Computer Associates International, Inc. while serving as chairman of CGA Computers, Inc. before founding Updata.

The acquisition marks another step by On-Line, a CICS systems house in Fort Lee, N.J., toward the DB2 follow-on market. Last September, On-Line acquired **Xtended Computing, Inc.'s** X/2ools, a set of DB2 utilities and catalog manager. The latest release of On-Line's UFO supports DB2.

Users of the fourth-generation language **Powerhouse** from **Cognos Corp.** will be able to gain access to mainframe data from Cognos-supported platforms, including the Digital Equipment Corp. VAX, the Hewlett-Packard Co. HP 3000 and HP-US, OS/2 or Microsoft Corp. MS-DOS-based personal computers, if Cognos' agreement with **DB/Access, Inc.** bears fruit. The pair plans to jointly develop an interface, Load/Powerhouse, for sale this fall.

Allbase/4GL, a fourth-generation language from HP, is now available on HP's Series 900 Precision Architecture processors. The language includes an SQL data base management system.

A vendor of dental, legal, construction and other specialized accounting systems for the IBM DOS world has made its product line available for the VAX. **Real-world Corp.** in Concord, N.H., will sell the modules for the VAX at $2,500 each.

How Customer Support Will Keep Pace with Tomorrow's Modem Technology

Created by Dayner/Hall, Inc., Winter Park, Florida

Lewis

CONTINUED FROM PAGE 25

Let's examine an issue in the current *Apple Computer, Inc.* v. *Microsoft Corp. and Hewlett-Packard Co.* suit. An underlying issue is whether Apple has a copyright on its pictorial expression of using file folders to simulate file cabinets, pull-down menus to select functions and a trash can to discard files.

According to the Copyright Office, if these screen-display images consist of original creative pictorial expressions, they are able to be copyrighted.

Another issue in the case may be whether HP appropriated the "look and feel" of the Macintosh by using similar images to express similar messages in a similar screen format. If there is a substantial similarity between the two screens, then it is possible that the court will find an infringement.

Substantial similarity is the test used most frequently to uncover copyright infringement. In applying the test, however, courts must answer one question: What is the "protected expression" in computer software?

Courts must determine whether copyright protects only the exact written code of a program or the broader interrelation of programming elements.

A recent case in point is *Whelan Associates, Inc.* v. *Jaslow Dental Laboratory, Inc.*, in which it was held that the textual expression of computer software consists of the specific interrelationship of structure, routines, algorithm, programming techniques and other program elements.

Also, the U.S. Supreme Court declined in January 1987 to hear the appeal of a 3rd U.S. Circuit Court of Appeals decision. This helped close the unlimited loophole through which infringement of a computer program is limited to copying the computer program text.

Some courts argue that some portion of an author's original code must be appropriated if copyright infringement is to be found in the look and feel of another programmer's computer screen display. But the courts should recognize that there are many ways for programmers to achieve the same processing of transactions and to write individual routines for specific purposes without resorting to copying source code.

Consequently, just because the code that creates a visual display is different does not negate the fact that it looks and feels like another programmer's original pictorial expression.

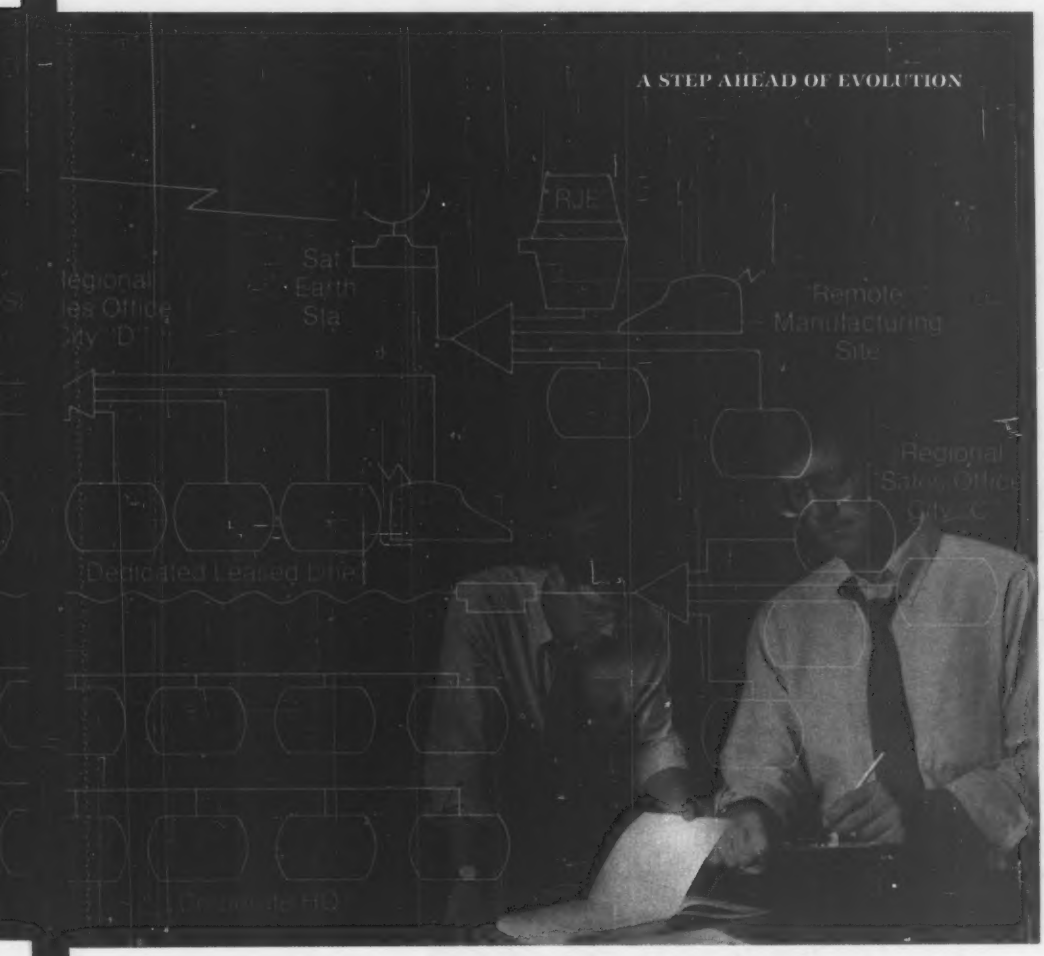
Are daydreams protected?

The interpretation of copyright protection should not be so broad that it goes beyond the programmer's specific ordered set of instructions to include underlying ideas and concepts. It is the collection of ideas, ordered in a specific manner, that is protectable by copyright.

The court in the Whelan case broadly defined the "expression of the idea" as the manner in which the program operates, controls and regulates the computer in receiving, assembling, calculating, retaining, correlating and producing useful information either on the screen, on a printout or by audio communication.

This court decision relates an acceptable interpretation of the protected expression that should be adopted by the judiciary in applying the substantial similarity test to detect infringement of computer software.

Lewis is the president of En Fleur Corp., a Raleigh, N.C., consulting firm specializing in software and hardware legal issues.



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Teradata

CONTINUED FROM PAGE 23

sis. The Model 3 is software and hardware compatible with the company's current Intel 80286-based Model 2 machines. An upgrade feature, which is field-installable for Model 2 systems shipped after this month, is also available for $24,000. Teradata currently claims an installed base of 69 customers.

According to Barnes, 90% of Teradata's customers use the machines in a decision-support capacity. The Model 3 was developed to extend the company's presence in critical production processing as well.

Rated at 3 MIPS

The Model 3, like its predecessor, is grounded in parallel-processing architecture, and each Model 3 system processor is rated at 3 million instructions per second. According to the vendor, the system is configurable from as few as three processors to as many as 1,024 to provide a capability of up to 3 billion instructions per second.

Each processor includes a minimum of 4M bytes of dynamic random-access memory, which is expandable to 8M bytes.

The machine also features a nonvolatile disk cache to increase the effective disk I/O bandwidth. The disk cache reportedly improves transaction response time and offers users a 60% increase in write-intensive applications, Barnes said. An optional 2M bytes of memory are available on all the disk processors.

The DBC/1012 Model 3 will be generally available in November. An entry-level Model 3 system that includes software and disk storage will range from approximately $275,000 to $325,000. A typical Model 3 system with 22 processors ranges from approximately $1.7 million to $2 million.

FEC

CONTINUED FROM PAGE 23

to the FEC, "all other reporting entities — party committees, nonparty committees, presidential committees and others — file directly with us," Hooper explains.

In calendar year 1988, he says, approximately 50,000 documents will come through the FEC, resulting in more than 400,000 detailed transactions entered into the system. To add to the urgency, the FEC is required to get each document on public record within 48 hours.

The documents are microfilmed and coded, and the data is entered into the FEC's time-sharing system, which is run by DEC's U.S. Operations Center in Parsippany, N.J. The host there is a VAX 8650 connected via three 56K bit/sec. lines to the D.C. operations. On-site in Washington, DSDD operates a VAX-11/750, which is used primarily for generating printed reports. Data entry is done during the day in D.C. on DEC VT241 and VT220 terminals, batch-processed at night in Parsippany and downloaded back to the 11/750 in Washington, where reports are ready first thing every morning. The FEC has a six-year, $3 million contract with DEC for this program.

Why a service bureau? "That was the approach we took from the very beginning at the FEC," Hooper says. "The reason was that we didn't want to invest in an operations center per se. We didn't have to be cognizant of the raised floor and air-conditioning and the security of tapes and storage and systems engineers on-site."

Because of this, Hooper's staff is not a large one — about 30 people — and includes programmers, statisticians, coders and data entry personnel.

While small, the data systems department is by no means idle. This year, the FEC is busy with the matching funds process, whereby eligible presidential candidates receive a portion of the money made available when U.S. taxpayers say yes to contributing a dollar to the fund.

"If a candidate comes in for matching funds, we have an obligation to go back out and audit their records at the close of the process," Hooper explains. That audit is currently in progress for a number of candidates, he adds. Public funds are also made available to the two major-party convention committees, and the FEC must also monitor that program.

Not only that . . .

In addition to supporting the current data processing needs of the FEC, Hooper, under the direction of Deputy Staff Director for Management James Pehrkon, is experimenting with other means of supporting the full FEC staff of about 250.

One experiment is under way in the office of the general counsel. There, Hooper has set up a prototype system to test word processing and document preparation within the agency. He has installed a second 11/750 on-site as well as two DEC RA81s for storage and has wired 17 intelligent DEC workstations to the 750, which functions as a file server.

Hooper has brought up a portion of the general counsel's staff to be pilot users of the prototype. Attorneys prepare their briefs directly on the system using DEC All-In-1 and WPS-Plus software. The documents stay in electronic format until the necessary reviews and changes have been made by all the required people, then are output on a laser printer. Normally, these documents are prepared manually until the final draft, when they are entered into Xerox Corp. 860 word processors.

The setup is a test to see not only how the computer system works but also how the members of the particular work group interact. Hooper says he plans to bring up a second test group in the general counsel division in September. The goal is to automate the entire FEC by early 1990.

Yet another function that data systems supports is the public Direct Access Program, in which interested parties can access the commission's financial disclosure data base. Any individual or group with a terminal and a modem can make a request through the FEC's press office to purchase access to a mirror image of the data base in Parsippany.

This is done via links such as Tymnet/McDonnell Douglas Network Systems Co.'s Tymnet or GTE Telenet Communications Corp.'s Telenet systems. The system has 102 users, ranging from individuals to corporations to the national media.

"We perform the administrative function," Hooper says, "and Digital has agreed to $25 per hour as an equitable amount. The common carrier charge is picked up in that fee, plus access to the machine and all usage on the machine."

To avoid the fee, individuals can use the FEC's public records room in Washington to access the same information. State records offices are given free data base access.

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Oil

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Co., seismic survey data — in the form of acoustic impulses recorded onto magnetic tape — had to be sent back to a lab for processing and was eventually translated into large maps, laboriously hand-drawn with colored pencils. "Now," he said, "we can load output from the processing center directly into workstations for interpretation."

In Tenneco's case, the workstations and the interpretation software they support are supplied by Geoquest Systems, Inc., another 4-year-old company based in Houston. In addition to speeding the explorer's tasks, Mitchell said, the workstation-based technology has ushered in increased accuracy and productivity and freed explorationists from total dependency on data centers.

"But the big story is the integration," he said. "We can interact with the company's data base, with well-log information; we can interactively change the looks of data, the scale."

Giant oil companies, according to Durwood Craft, a district geophysicist at New Orleans-based Placid Oil Co.'s home office, "were experimenting with interpretive software back in the '60s, but the computer power just wasn't there." For less-than-giant companies, the dollars were not there. Now, Craft said, "the majors are using Crays." Placid is using Landmark dedicated CAEX workstations and software, which are playing a pivotal role in a venture that could be either Placid's greatest or its last.

A Hunt brothers firm, the company has formally been in bankruptcy since 1986. Placid is attempting to work its way back to solvency by drilling for oil in the 1,520- to 2,500-foot-deep waters of the Green Canyon Lock 29 in the Gulf of Mexico off the Louisiana coast.

The early days

Early exploratory efforts in Green Canyon required — and yielded — vast amounts of data, both Placid's own and additional data bought from research organizations. "We couldn't handle it with our staff without technological aid," said Peter Kane, Gulf of Mexico region district geologist at Placid. Even with unlimited staff, he added, there were limits to how far humans could go in analyzing the data that could tell the Placid team whether Green Canyon was likely to bring them fortune or ruin.

The company turned to CAEX. With Landmark workstations and interpretation software, Kane said, a team of 21 people — eight technologists, four geologists, four geophysicists and five support staffers — was able to view fault patterns and salt structures from multiple directions and reconstruct the history of oil deposits at the subsea site in an amount of time that would have been impossible for so small a staff working manually — and at a level of specificity that would have been impossible for any number of human beings.

Green Canyon, slated for production by mid-August, will be the world's deepest subsea oil well drilled from a floating production platform. It will depend heavily on CAEX systems for ongoing map revision that will reduce the decision time between wells, Placid's Craft said. Without CAEX, he added, "you just couldn't play the game out there in the gulf."

Gibson

CONTINUED FROM PAGE 23

be able to get any color of computing you want, as long as it is black.

Those bourgeois software systems — VMS, MVS and others — are headed for the ash heap of history. A new user will emerge, free of the shackles of the capitalist vendors.

The vendors won't make any profit, of course. That would be stealing from the workers, those users who put their shoulders to the wheel to wrest productivity from computers. Those reactionary vendors will be sent to re-education camps and forced to work on computer-production cooperatives somewhere in the Midwest.

Indeed, it shall be as Karl Marx foresaw: "From each [vendor] according to his abilities, to each [user] according to his needs . . . Users of the world, unite! You have nothing to lose but your chains!"

Whoa! Wait a minute! If global economics is any guide, it just may not happen that way.

Sure, the standards movement will have its influence just as socialism has influenced capitalism. But has socialism triumphed? It doesn't look that way today. Without question, the countries of established socialism are now adopting many capitalist methods.

Even if the Open Software Foundation does make a product, there is absolutely no guarantee it will sell. In the computing community, despite the idealism of the open systems movement, there is no enforcement wing to make sure that a product is purchased.

Esperanto, another great idea, was an amalgam of the world's languages, created to make life on our shared globe easier and to foster understanding and peace. Today, nobody speaks it, and many have never heard of it. Why? Maybe because it had no history, no culture.

Ultimately, it will be the productivity of open systems, not their openness, that will determine their rise or fall — and whether they ever become standards.

Gibson is *Computerworld's* senior editor, systems.

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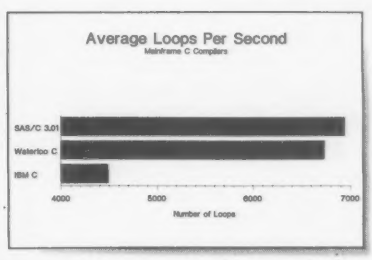

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Processors

The Federal Systems Division of **Gould, Inc.** has announced the **Deskside Tempest Computer System.**

The supermini system was designed to meet Nacsim 5100A standards. It comes with a choice of either the Gould MPX-32 real-time operating system or the Gould UTX/32 Unix operating system with real-time enhancements. The multiuser system is 17-in. wide by 30-in. high by 34-in. deep.

The Deskside Tempest Computer System costs $81,000.

Gould Computer Systems Division, 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33340. 305-587-2900.

Data storage

A disk controller that reportedly will enhance the configuration options for Digital Equipment Corp.'s Microvax and MicroPDP-11 computers is now available from **Dilog Corp.**

Called the **MQ696**, the multipurpose controller was designed to interface up to two enhanced small device interface Winchester disk drives with data transfer rates up to 2.5M byte/sec.

The system can also interface up to two SA450-compatible floppy disk drives to DEC Q-bus computers. A command queue buffer that can reportedly store up to 16 seek commands for the hard disk is also included. The controller is compatible with the DU-driver contained in the DEC RT-11, MUMPS, MicroVMS and Ultrix operating systems. The unit is contained in a single dual-height module.

The MQ696 will cost approximately $1,500.

Dilog, 1555 S. Sinclair St., Anaheim, Calif. 92806. 714-937-5700.

An electronic vaulting service that was designed to provide on-line, real-time recovery of critical applications has been introduced by **Sungard Recovery Services.** Dubbed **Sunvalt**, the product is targeted primarily at transaction-oriented companies in the banking, securities and manufacturing industries.

Sunvalt replaces the traditional method of physically transporting backup tapes to off-site facilities by implementing an on-line system that captures and redirects data to a dedicated vault.

Channel extension equipment supplied by Dataswitch Corp. provides the necessary link between the production center and the vault location.

Sunvalt costs from $3,500 to $15,000 per month.

The monthly fee includes hardware, software and telecommunications requirements.

Sungard, 1285 Drummers Lane, Wayne, Pa. 19087. 215-341-8700.

Terminals

BTG, Inc. has augmented its line of Rugged/Tempest transportable workstations. The company is now offering a Motorola, Inc. 68030-based model as part of its RT-300 series.

Called the **RT-360B**, the workstation reportedly performs at a rate of 5 million instructions per second and supports the Motorola 68882 floating-point processor. The unit also supports up to 100M bytes of disk space internal to the chassis using removable Winchester cartridges, the vendor said.

BTG's RT-300 series of workstations was designed specifically for military and industrial applications that require use in harsh environments.

The RT-360B costs from $46,000 for a flat-panel configuration to $65,000 for a 16-in., 1,280- by 1,024-pixel color version.

BTG, 1945 Old Gallows Road, Vienna, Va. 22180. 703-556-6518.

Printers/Plotters

Honeywell Bull Italia has announced a high-resolution, 18-wire, dot matrix color printer.

The **4/68** is to be equipped with a moving ruby print head that reportedly provides a speed of 600 char./sec. in draft mode and 150 char./sec. in letter-quality print modes. The print head can be switched between two wire configurations: staggered for word processing in higher solutions and dual in-line for data processing. The printer can accommodate one to five carbon copies and is said to have a mean time between failures that is more than 7,000 hours.

The 4/68 costs $2,450.

Honeywell Bull Italia, 200 Smith St., Waltham, Mass. 02154. 617-895-3672.

The **Data Communications Division** of **Harris Corp.** has announced a laser printer that provides output support for both stand-alone microcomputers and network-attached devices.

The **Harris 9812 Laser Printer** supports a variety of paper sizes and has an optional paper cartridge unit that holds up to 500 sheets, expanding total paper capacity to 750 sheets, the vendor said. Available print applications include straight text, charts, graphs and overhead foils.

The Harris 9812 costs $4,200 for a basic configuration.

Harris, Data Communications Division, 16001 Dallas Pkwy., Dallas, Texas 75248. 214-386-2000.

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MainLink II's half-card size means you can install it in any laptop PC—such as the Datavue® SNAP™—that accepts add-on boards. You can turn that PC into a truly portable terminal. The half card also saves precious space inside the case of desktop and "luggable" PCs.

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Power on Self Test	●		
PC/XT/AT/PS2 Compatible	●	●	●
3174, 3274 Supported	●	●	●
Emulation and IBM IND$ File Transfer	●	●	●
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Price	*$545	ø$1,294	+$1,020

* - MLII-E $545.00, MLII-EM Micro Channel Version $645.00
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NEW PRODUCTS — SOFTWARE

Systems software

The Wollongong Group, Inc. has introduced **Eunice BSD 4.3**, an enhanced operating system environment that provides a University of California at Berkeley Unix 4.3 environment on Digital Equipment Corp. VAX/VMS systems.

According to the vendor, Eunice BSD will allow VAX users to access VMS, Unix or integrated VMS and Unix operational environments. Version 4.3 can be used for the same applications as the Berkeley Unix, with the exception of system administration, which is done under VMS.

The product reportedly can produce both Berkeley Unix and VMS executable files from the same Unix source code.

Eunice BSD 4.3 costs $5,000 for a four-user Microvax and $17,200 for a 16-user VAX 8800. Prices include Unix System V, Release 2 licensing.

The Wollongong Group, 1129 San Antonio Road, Palo Alto, Calif. 94303. 415-962-7112.

Applications packages

Updata Software Co. has released an updated version of its ISPF-style editor for IBM's DB2 and SQL/DS that allows users to create and edit test tables.

DB/Proedit Version 3.0 features several enhancements, including Find command and double-character block commands and the ability to copy from one table even if the structures are dissimilar. The software also features embedded SQL testing.

Annual rental costs for DB/Proedit Version 3.0 range from $1,775 to $5,400. Perpetual licenses cost from $5,500 to $16,200.

Updata Software, 960 Holmdel Road, Holmdel, N.J. 07733. 201-946-2000.

Tandem Computers, Inc. has introduced **Surveyor** performance-management software for its series of Nonstop computer systems.

According to the company, Surveyor will manage system performance data and assist in capacity planning functions. The package is based on Nonstop SQL, Tandem's relational data base management software, and will permit easy access to performance data through preformatted performance reports. Exception reports are also provided to simplify identifying and monitoring potential performance problems.

Surveyor costs from $2,500 to $5,000 for the initial license fee, depending on CPU.

Tandem, 19333 Vallco Pkwy., Cupertino, Calif. 95014. 408-725-6000.

Utilities

Version 5 of the **SAS System** for IBM's 370, 3080, 3090, 4300 and 9370 series running VSE has been announced by **SAS Institute, Inc.**

The SAS System under VSE is an integrated software system for data management analysis and presentation.

Enhancements to the base SAS software include the ability to read, write and update VSAM files using the SAS System's procedural language and an SAS statement. Version 5 reportedly includes integrated modules for data entry, retrieval and management; report writing and graphics; an interface to IBM's DL/1 data bases; and other options.

The first-year license fee for base SAS software ranges from $3,200 to $15,000, depending on machine classification.

SAS Institute, Box 8000, SAS Circle, Cary, N.C. 27512. 919-467-8000.

Languages

Unify Corp. has announced an extension of its Accell fourth-generation language development system that reportedly adds the graphical interface of Microsoft Corp.'s Windows to Accell-built Unix applications. According to the vendor, **Accell/CP** for Microsoft Windows offloads presentation processing from the Unix host computer onto Microsoft MS-DOS-based personal computers to improve system performance and productivity.

Features include pull-down windows, scroll bars, icons and a mouse. Windows are used to separate different tasks, and the product runs on all Unix, Xenix and Unix-derived systems, regardless of machine size class.

Accell/CP costs from $1,185 for three users on an IBM Personal Computer AT or compatible to $29,625 for 75 users on a mainframe.

Unify, 3870 Rosin Court, Sacramento, Calif. 95834. 916-920-9092.

Training software

Data Base Architects, Inc. has announced **Online Expert**, software that provides Cullinet Software, Inc. developers with an interactive computer-based training system. In simulation mode, information is provided that describes each Cullinet tool, the use of each screen and the options for each field. The software also provides on-line access to a life cycle methodology for designing and building Cullinet applications and data bases.

Online Expert is available now. The license fee depends on user configuration.

Data Base Architects, 980 Atlantic Ave., Alameda, Calif. 94501. 415-521-7300.

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VM Installation Workshop	7/25/88 Houston 8/15/88 Columbia (MD)
REXX/XEDIT Workshop	8/02/88 Houston
MVS/SP2 Structure and Flow	8/08/88 Chicago
MVS Concepts and Facilities	9/07/88 Orange (CA)

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   65. Communications Systems/Public Utilities/ Transportation
   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
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   31. Dir., Mgr., Suprv., of Programming
   32. Programmer, Methods Analyst
   35. Dir., Mgr., Suprv., OA/WP
   38. Data Comm. Network/Systems Mgt.
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgr.
   12. Vice President/Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales/Mktg. Mgt.
   OTHER PROFESSIONALS
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   80. Educators, Journalists, Librarians, Students
   90. Others _____ (Please specify)
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MICRO BITS

Douglas Barney

Lotus sees a shrink

Lotus language lament? To shrink the size of Lotus's 1-2-3 Release 3.0, the firm may switch C compilers. But according to a Microsoft source, the switch may cause a hitch in Lotus's attempt to have Release 3.0 run under both OS/2 and Microsoft's MS-DOS.

Here's how it may work: If Lotus wants Release 3.0 to simply run under MS-DOS and OS/2, a non-Microsoft compiler is fine. But if Lotus wants Release 3.0 to take advantage of OS/2's multithreading — that is, let applications multitask within themselves — it may not be possible with most of the C compilers on the market without adding a huge amount of extra code. Watch this space for the word from Lotus.

Mini makers bungle micros. Why is it that most minicomputer and mainframe vendors do such a poor job in the personal computer market? Because PCs aren't host computers, that's why. And adding communications pieces, which are already available off the shelf, just won't help.

Continued on page 51

Dbase creator brews up 1-2-3 add-in

BY ALAN J. RYAN
CW STAFF

INCLINE VILLAGE, Nev. — C. Wayne Ratliff is at it again.

The creator of Ashton-Tate Corp.'s Dbase has developed Summit, a Lotus Development Corp. 1-2-3 data base add-in that began shipping earlier this month.

Summit, part of Migent Software, Inc.'s Emerald Bay family, reportedly provides an open platform for developing applications that share data using a common storage and retrieval method. Because of the platform, Summit is able to access and analyze any Emerald Bay data file from within 1-2-3, the company said.

The core components of Emerald Bay — Report Writer, Forms Generator, Database Administrator, Import/Export Utilities and Emerald Bay Personal Engine — are included in Summit, allowing Summit users to create an Emerald Bay data base within 1-2-3 and access the Emerald Bay data base dictionary, which maintains field types and security controls.

Big user base

The $195 Summit package will allow the three-million-user 1-2-3 installed base to use Emerald Bay's data base management capabilities from within the spreadsheet, according to David Patrick, Migent's vice-president of marketing.

Additionally, Migent said it has shipped the first set of software updates for its Emerald Bay development products — Eagle and the Developers Toolkit for C.

The updates to Eagle, Emerald Bay's Dbase-like programming language, also written by Ratliff, extend binary field support and add new language extension routines.

Eagle is the first personal computer data base product to offer binary field support, the vendor claimed, which means that unlike Dbase, Emerald Bay applications can store, retrieve and manipulate virtually any type of digital information, from data and text to graphics or sound.

Improvements of the Eagle Import/Export Utility allow exporting and importing of data between any Emerald Bay application and Dbase, 1-2-3, ASCII delimited or fixed and Migent's Ability and Ability Plus series.

New language extension routines allow developers to use C or assembly to create their own Eagle commands and add-ins. A new Forms Design Utility allows predesigned forms to be used directly within Eagle.

Registered users will receive the updates from Migent free of charge. Eagle and the Developers Toolkit for C are priced at $495 each.

Migent also announced that DGE, a data base graphics package from Pinnacle Publishing, will support the Eagle data base management surface. DGE is priced at $195.

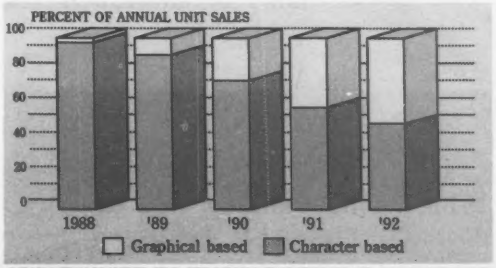
Inside

- A comparison shopping list for the PC market. Page 37.
- Hyosung unveils IBM PC compatibles. Page 39.
- IBM Quickwriter goes to work. Page 50.

Data View

The changing face of OS/2

As users seek graphical-based software for its ease of use, character-based packages are expected to lose market share



INFORMATION PROVIDED BY DATEX INFORMATION SERVICES AND SUMMIT STRATEGIES
CW CHART

Microsoft in push for Cobol

Micro Focus version keys language strategy

BY DOUGLAS BARNEY
CW STAFF

For years, Microsoft Corp. has hawked a wide variety of languages but has emphatically pushed C as the language of the future. But now, DP types can rest assured that Microsoft does indeed love Cobol. The firm has announced a Cobol strategy both to show that affection and to lure MIS into the firm's OS/2 operating system.

However, the new Microsoft Cobol 3.0 strategy marks the end of Microsoft Cobol as we know it and the beginning of Micro Focus Ltd. Cobol, which will be the foundation of future Microsoft Cobol products.

Despite Microsoft's C leanings, the firm gushed over Cobol during the recent announcement, calling it "still the most popular computer language." And based on hardware and operating system advances, Cobol's future will only get brighter.

"It is not a downgrading of

Continued on page 50

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Plus, MacMainFrame supports every Macintosh from the 512Ke to the Macintosh II. It's affordable. It's reliable. It works with IBM IND$FILE. It's even available with an optional Application Programming Interface.

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For the name of the authorized MacMainFrame dealer nearest you, call 1-800-289-2526, ext. 28. Or write Avatar Technologies, 99 South Street, Hopkinton, Massachusetts 01748. Admittedly, you could give your Macintosh users something less than MacMainFrame. But wouldn't that be scary?

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REVIEWS/NEW PRODUCTS

Rating the 386 speed demons

20-MHz systems from HP, Compaq, others get put through the paces

What started as a trickle turned into a stream and then a flood. Between Comdex/Fall '86 and Comdex/Fall '87, the number of Intel Corp. 80386 vendors grew from two to 27. Today, more than 100 companies sell 386-based systems, with more vendors entering the market every week.

For the following comparison, we asked vendors to supply us with their best price/performance 20-MHz 386 system within the following guidelines: 4M bytes of random-access memory, their fastest hard drive in the 60M- to 90M-byte range and an IBM Enhanced Graphics Adapter (EGA) board.

Generally, one serial port and one parallel port are standard. Some systems also include a game port. All the 386 systems tested support a math coprocessor. The best of the bunch can accept both the Intel 80387 and the Weitek 1167 chips.

Most of the systems came with either a 5¼-in., 1.2M-byte floppy drive or a 3½-in., 1.44M-byte floppy drive. Several systems came with both drives. No system came with fewer than four 16-bit slots and one 8-bit slot. Many of the systems also include 32-bit slots, some of which are proprietary and can handle only the vendor's own boards. Currently, the only standard for 32-bit slots is for Micro Channel boards, which are available only for IBM Personal System/2 computers.

• Hewlett-Packard Vectra RS/20 PC

The Hewlett-Packard Co. Vectra RS/20 PC is a floor-standing system that runs at 20 and 8 MHz.

Performance: The Vectra scored a very good in CPU speed. The 103M-byte HP ESDI hard drive demonstrated notable speed and earned a very good score in sequential access. The Vectra also rated a very good score in hard-disk random access.

HP's Vectra RS/20 PC *ranks tops for hardware*

Compatibility: Software — Very good. Hardware — Excellent. Although we had some initial difficulty getting Windows 386 to work, the Vectra ran all the software in our test suite and worked with each component of our hardware test suite.

Expandability: Excellent. The Vectra came with a 103M-byte drive, three serial ports, two 8-bit slots, six 16-bit slots and two proprietary 32-bit slots.

Documentation: Good. Documentation for the Vectra is voluminous. There are separate manuals covering EGA, I/O, utilities, the setup and terminal programs and "learning about your computer." A table of contents and an index accompany the books.

Ease of use: Good.

Setup: Good. Setup and diagnostics software are bundled with the Vectra, as are DOS and Windows 386. Special features include two-way interleave in page mode so the CPU does not have to wait for the memory refresh.

Workmanship: Very good. The Vectra is well-built and solidly constructed. We found no last-minute additions. The motherboard is nicely laid out and designed. The case is particularly well-made.

Support: Policies — Satisfactory. Technical support — Satisfactory. HP offers a one-year warranty on the Vectra. Repairs are handled by authorized service centers. Optional support policies and extended warranties are available. Additional support is available through Compuserve. Free technical support is available through dealers, but HP charges $45 per problem or incident for its own toll-free technical support service.

Value: Satisfactory. Although HP's Vectra performed and scored above average in almost all categories, the $11,633 price tag for a system with a 103M-byte hard disk, 4M bytes of RAM, an EGA board and a monitor is steep.

• Compaq Deskpro 386/20

Although no longer the fastest 386 system available, the Compaq Computer Corp. Deskpro 386 still holds its own among the tough competition.

Performance: The Deskpro 386/20's CPU rating earned an excellent score. With a 60M-byte Control Data Corp. hard drive, the Deskpro 386/20 earned a satisfactory score in sequential access. Hard-disk random access earned a very good score.

Compatibility: Software — Very good. Hardware — Excellent. All the programs in the test suite ran without difficulty. Compaq's own version of OS/2 worked fine. The four peripherals used in the hardware compatibility test also ran fine.

Expandability: Excellent. There are one 32-bit, five 16-bit and two 8-bit slots on the Compaq motherboard. The 32-bit slot is proprietary and not compatible with either 8- or 16-bit boards.

Documentation: Excellent. Compaq's documentation is clear and well organized. There are three books that cover operations, Microsoft's GW Basic and DOS. The setup instructions are geared toward novices, and information is provided on troubleshooting and video board installation.

Compaq's Deskpro 386/20 *still has merit*

Ease of use: Good.

Setup: Good. Compaq bundles setup, diagnostics, Compaq's expanded memory manager and disk caching drivers with the system. Compaq DOS is also included.

Workmanship: Good. Overall construction of the Deskpro 386/20 is solid. We found no last-minute additions to the hardware. Layout and design are good.

Support: Policies — Satisfactory. Technical support — Satisfactory. Compaq offers a one-year warranty on the Deskpro 386/20. Repairs are handled through authorized dealers only. Optional support plans and extended warranties are available. Technical support for the Deskpro 386/20 is offered only through authorized dealers. Of the two local dealers we called, both answered our questions correctly but only one truly knew the system and related peripherals well.

Value: Satisfactory. For $10,896, the Deskpro 386/20 with a 60M-byte hard disk, 4M bytes of RAM, an IBM Video Graphics Array (VGA) board and monitor scores high in CPU speed and hard-disk random access. Dealer-only technical support can result in spotty service, however.

• Advanced Logic Research's Flexcache 20386

With the second fastest CPU speed of any product tested, the Flexcache 20386 from Advanced Logic Research, Inc. (ALR) stands out among the competition.

Performance: The system rated excellent in both CPU speed and in hard disk sequential access. Hard disk random access got a very good score.

Compatibility: Software — Very good. Hardware — Excellent. The Flexcache ran all the programs in our software test suite without difficulty. ALR claimed the unit is compatible with Microsoft Corp.'s OS/2 Software Developer's Toolkit. The four hardware peripherals used in testing — a Hayes Microcomputer Products, Inc. modem, an Ethernet card, a tape backup and Video 7, Inc. video graphics array board — did not pose a problem.

Expandability: Very good. The ALR computer fell short in only one expandability area — the machine's lock secures only the keyboard, not the case. The Flexcache comes with two 8-bit slots, four 16-bit slots and a pair of "hi-low" 16-bit slots that combine to make one 32-bit slot that can only be used with ALR's memory board.

Documentation: Very good. ALR's documentation offers installation and operating instructions for beginners but no short form for expert users. Diagrams complement the text material.

Ease of use: Satisfactory. The power switch on the Flexcache is set in a trapdoor on the back panel, a real inconvenience if the unit is sitting under a desk

Continued on page 38

Test results

Product comparisons of 20-MHz 80386-based systems

	ALR Flexcache 20386	AST Premium/386	AT&T 6386E WGS	Compaq Deskpro 386/20	Hewlett-Packard Vectra RS/20 PC	IBM PS/2 Model 80-111
CPU speed	Excellent	Very good	Very good	Excellent	Very good	Very good
Hard-disk sequential access	Excellent	Excellent	Excellent	Satisfactory	Very good	Very good
Software compatibility	Very good	Excellent	Very good	Very good	Very good	Very good
Hardware compatibility	Excellent	Excellent	Excellent	Excellent	Excellent	Poor
Expandability	Very good	Very good	Excellent	Excellent	Excellent	Very good
Documentation	Very good	Excellent	Good	Excellent	Good	Very good
Ease of use	Satisfactory	Good	Good	Good	Good	Good
Technical support	Very good	Good	Very good	Satisfactory	Satisfactory	Good
Value	Good	Good	Good	Satisfactory	Satisfactory	Satisfactory

CW CHART

Rating

CONTINUED FROM PAGE 37

or against a wall.

Setup: Good. ALR packages setup software and a hard disk formatter/interleaver with the Flexcache 20386. The system also comes with Control 386, a set of Microsoft MS-DOS utilities from Phoenix Technologies, Inc. Video drivers and virtual mode emulators are also bundled with the unit. DOS is not included.

Workmanship: Poor. Overall design and layout of the machine are average. Although the case was well-built, we were disappointed with the quality of workmanship on the motherboard, which included wiring added after the board was completed.

Support: Policies — Good. Technical support — Very good. ALR offers a one-year warranty and a 30-day money-back guarantee on the Flexcache 20386. An extended warranty is available. Repairs are handled through the vendor or authorized dealers. Technical support for the Flexcache is not toll free, but each of the technicians we spoke with knew the machine well and demonstrated a broad knowledge of peripherals.

Value: Good. The Flexcache 20386 is one of the fastest systems around. A system with a 60M-byte hard disk, 4M bytes of RAM, an EGA board and a monitor costs $9,763.

• AST Premium/386

With the Premium/386, AST Research, Inc. brings a solid performer into the high-end 386 market.

Performance: The Premium/386 earned a very good score in CPU speed. The system's hard disk sequential rating was the fastest in this comparison, earning an excellent score. Hard-disk random access, rated very good, was almost as impressive.

Compatibility: Software — Excellent. Hardware — Excellent. The Premium/386 ran all the programs in our software test suite and is compatible with IBM's OS/2. AST also sells its own version of the operating system. It also offers three processing speeds: 20, 6 and 4.77 MHz. The unit worked with all components of our hardware testing.

Expandability: Very good. Like the Flexcache 20386, the Premium/386 does not have a lock for the case, although the keyboard itself can be secured. The system has seven expansion slots: two 8-bit slots, four 16-bit slots (three of which can be used with either standard 16-bit cards or AST's Smartslot cards) and one proprietary 32-bit slot. The evaluation unit came with 4M bytes of memory, all of which were provided on a separate card rather than on the motherboard.

Bonus: The system earned a design merit bonus for its use of the Smartslot Architecture, which, according to AST, offers most of the functionality of the Micro Channel architecture without losing compatibility with IBM Personal Computer AT-class machines.

Documentation: Excellent. The manual includes installation and operating instructions for novices and experts. A troubleshooting section covers problems and solutions and describes on-line error messages. There is a table of contents, an index and a glossary.

Ease of use: Good.

Setup: Good. Diagnostics, cache, RAM disk and spooler software are bundled with the machine. AST also includes MS-DOS and extended mode memory (EMM) drivers, which allow EEM to be used as expanded memory specification.

Workmanship: Very good. Overall design and layout are above average. The case and interior feature solid construction, and we found no last-minute additions to the motherboard.

Support: Policies — Good. Technical support — Good. A one-year warranty is offered on the Premium/386. Repairs are handled by AST and authorized dealers. On-site service and extended warranties are available through Honeywell Bull, Inc. AST also offers a bulletin board service for on-line help. AST maintains a technical support line, but calls are not toll free. The technicians we spoke to were knowledgeable and answered our questions accurately and promptly.

Value: Good. Although an AST Premium/386 with a 90M-byte hard disk, 4M bytes of RAM, an EGA board and a monitor costs $10,775, it offers good speed, excellent documentation and solid support.

• AT&T 6386E Work Group System

AT&T's 6386E WGS is a towering giant with a fast 135M-byte hard drive. Optimized for the Unix operating system, the system supports up to 64M bytes of RAM.

Performance: The 6386E earned a very good score for CPU speed. The enhanced small device interface (ESDI) hard disk earned an excellent score in sequential-access rate and a very good score in random access performance.

Compatibility: Software — Very good. Hardware — Excellent. The 6386E ran all components of our hardware and software testing. AT&T claimed the unit runs the OS/2 Software Developer's Toolkit.

Expandability: Excellent. The 6386E comes with 11 expansion slots: two 8-bit, five 16-bit and four 32-bit. The 32-bit slots are downward-compatible and can accept both 8- and 16-bit boards. There are five full-height mounting positions on the machine.

Documentation: Good. Documentation for the 6386E WGS is divided into a

Continued on page 49

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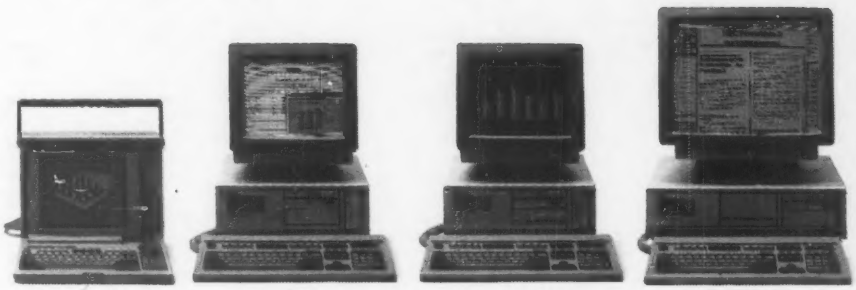

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NEW PRODUCTS

Systems

Several IBM-compatible personal computers have been announced by **Hyosung Computer.**

The **Maxar 286L** is an IBM Personal Computer AT-compatible system that reportedly features an 8- to 12-MHz system clock and 512K bytes of on-board random-access memory, expandable to 1M byte. The system sells for a price of $1,759.

The **Maxar 30L** computer was designed to provide users compatibility with the IBM Personal System/2 Models 25 and 30. The system was built around a 16-bit Intel Corp. 8086 microprocessor and includes a dual-speed clock and calendar. The Maxar 30L measures 16 by 15 by 4 in. and costs $1,269.

The AT-compatible **Maxar 286T** features a 12-MHz clock speed and comes standard with 1M byte of on-board RAM and selectable wait states of zero or one. The Maxar 286T costs $2,219.

All three systems include Microsoft Corp. MS-DOS and GW Basic Version 3.21 with manuals.

Hyosung Computer, Suite 285, 710 Lakeway, Sunnyvale, Calif. 94086. 408-733-0818.

Nestor, Inc. in Providence, R.I., and **Datacube, Inc.** in Peabody, Mass., have joined forces to combine neural networks with image-processing capabilities, a reported breakthrough for the visual inspection and robotics markets.

The firms are integrating the neural network-based **Nestor Development System** and Datacube's **Max Vision** image-processing workstation and software package to create an intelligent system that will learn from examples to recognize objects, characters and other images. According to the companies, the system will address the needs of the industrial, government and military markets.

The Nestor Development System costs from $7,500. The Max Vision ..ardware subsystem connects to an IBM Personal Computer AT expansion slot and costs $9,500.

Nestor, One Richmond Sq., Providence, R.I. 02906. 401-331-9640.

A hand-held Microsoft Corp. MS-DOS personal computer that features an Intel Corp. 80C88 microprocessor has been announced by **Micro Palm Computers, Inc.**

The **PC/5000** was designed for data capture, processing and transmission in rugged environments. The battery-powered unit reportedly can function in temperatures ranging from -22 to 158 degrees Fahrenheit. The system comes

Micro Palm's *PC/5000*

with a standard memory of 256K bytes, expandable to 2.2M bytes. Removable memory modules are available in 128K-, 256K-, 512K- and 1M-byte configurations. The unit has a 20-char. by 8-line LCD screen with graphics capability.

The PC/5000 costs $3,295.

Micro Palm Computers, 13773-500 Icot Blvd., Clearwater, Fla. 34620. 813-530-0128.

A 25-MHz Intel Corp. 80386-based portable computer has been introduced by **Mini-Micro Business Systems Corp.** Called the **Ultraspeed 386 Portable**, the computer reportedly offers six internal bus slots and will support up to 8M bytes of 32-bit, zero-wait state memory on the system board.

An optional Intel 80287 math coprocessor is available, and the unit weighs between 17.5 and 19.9 pounds depending on configuration. An additional 8M bytes of random-access memory may be installed on the memory expansion board for a total of 16M bytes.

The Ultraspeed 386 Portable costs from $5,695 to $6,495, depending on configuration ordered.

Mini-Micro Business Systems, P.O. Box 13063, Boulder, Colo. 80308. 303-444-3746.

Fingermatrix, Inc. has introduced the **Ridge Reader Mint.**

The Ridge Reader Mint uses fingerprint ridge characteristics called minutiae as the basis of fingerprint comparison. Verification is made in approximately three seconds, and an audit trail facility logs the time, name and location of each person granted access. All failed attempts are also recorded.

The Ridge Reader Mint costs from $1,300 to $3,300 per entry point, depending on configuration.

Fingermatrix, 30 Virginia Road, North White Plains, N.Y. 10603. 914-428-5441.

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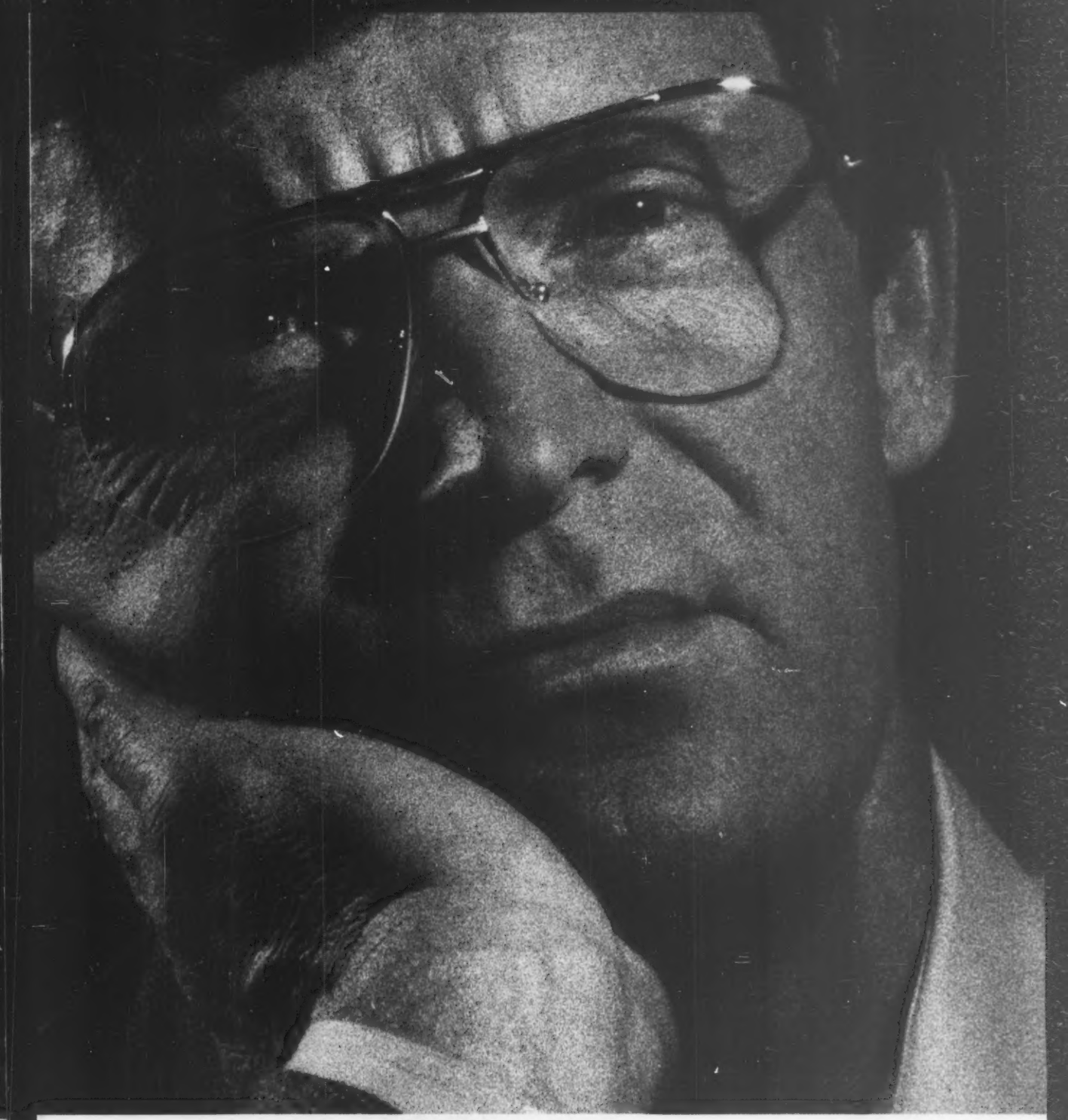

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Software applications packages

IBM Personal Computer-compatible software that can reportedly transform research table data into a perceptual map has been introduced by **Market Action, Inc.**

Aimed primarily at marketing and scientific research data analysts, **Stratmap 5.0** downloads data from ASCII or Lotus Development Corp. files to create presentation graphics.

Stratmap 5.0

The software can summarize up to 10,000 numbers, 200 categories and 96 tables on one perceptual map. Each map may be automatically rotated, sized, edited and colored for graphics presentations. An IBM PC, PC XT, AT or compatible running Microsoft Corp. MS-DOS 2.1 or higher is required.

Stratmap 5.0 costs $495.

Market Action, Business Technology Center, Bradley University, Peoria, Ill. 61625. 309-677-3299.

Management Graphics, Inc. has enhanced its PC-Slide family of presentation graphics software with the addition of several modules to complement **Slideworks**, the core of its PC-Slide series.

Slideworks is said to give users the ability to design text, pie, bar, line, area and organizational charts in 255 colors.

The **Presentation Assistant**, which is now available, includes 24 extra typefaces and offers support for plotters, thermal printers and Adobe Systems, Inc. Postscript.

The **Imager** module permits the production of 4,000 resolution slides in-house, and the **Manager** allows electronically received slide jobs to reside unattended on one computer while another computer automatically processes visuals and generates invoices.

Slideworks costs $245, the Presentation Assistant costs $346, the Imager costs $800, and the Manager costs $1,605.

Management Graphics, 1450 Lodestar Road, Downsview, Ont., Canada M3J 3C1. 416-638-8877.

Quandu Computing, Inc. has released **Rollcall**, a software package for IBM Personal Computers and compatible systems that reportedly will provide instant access to names, addresses and telephone numbers.

Rollcall is said to allow a user to keep track of up to 65,500 entries and can automatically insert a person's name and address into a word processed document. The package comes in either 5¼- or 3½-in. diskette formats.

Rollcall costs $49.95.

Quandu Computing, 12040 S. Lakes Drive, Reston, Va. 22091. 703-264-8900.

A C graphics library said to mimic all Microsoft Corp. Quick C graphics functions on a Hewlett-Packard Co. serial plotter is available from **Gamut Software Development.**

The **QC-Plot** library is activated by selecting a device number — all function calls are identical in form to Quick C calls but are prefixed with the letter k, the vendor said. The product will direct output to any HP 7400 series serial plotter, or HP's HPGL script can be directed to a disk file for later printing or redisplay on the screen. Color mapping functions include 16 screen colors into one to eight pens.

QC-Plot costs $99.

Gamut Software Development, 9616 Northridge Court, Richmond, Va. 23235. 804-320-8835.

A real-time financial data application that runs in Microsoft Corp.'s Windows 2.0 environment has been announced by **Multex, Inc.**

Called **Multexquote**, the package reportedly uses the Microsoft Windows Dynamic Data Exchange protocol to give Microsoft Excel users a direct link to market information. The product's source of financial in-

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telligence is Lotus Development Corp.'s Lotus Signal market information service. A Microsoft Excel sheet linked to Multexquote automatically receives the latest data and recalculates any associated graphics so analysis of market conditions can immediately be seen by the user.

An IBM or compatible machine based on Intel Corp.'s 80286 or 80386 chip with a minimum of 640K bytes is required; 1M byte or more is recommended. Microsoft Windows 2.03 or higher or Microsoft Windows/386 2.03 is also necessary. Users will need Signal hardware and software and a market data service subscription.

Multexquote costs $350.

Multex, 254 W. 31st St., New York, N.Y. 10001. 212-629-7994.

Software languages

A programming language that reportedly combines procedural, declarative and data base programming structures into one programming environment is now offered by **Complete Logic Systems, Inc.**

Called **Trilogy**, the product was developed to eliminate the necessity of more than one environment when developing procedural, logic and data base applications. The unifying factor in Trilogy is a language based on predicate calculus, the vendor said. It may be implemented on an IBM Personal Computer, PC XT, AT or compatible. A minimum of 512K bytes of random-access memory is required.

Trilogy costs $99.95.

Complete Logic Systems, 741 Blueridge Ave., North Vancouver, B.C., Canada V7R 2J5. 604-986-3234.

English Knowledge Systems, Inc. has released **Jake**, an application-independent natural language user interface. The product can reportedly be interfaced to data base, graphics, educational, control, utility and business programs.

The product consists of a library of routines that may be used with Microsoft Corp.'s C and Turbo C under Microsoft's MS-DOS. English commands and queries are translated into function calls and data structures, and the interface is said to allow application-specific, context-sensitive semantic processing.

Jake costs $495. A demonstration copy is available for $10.

English Knowledge Systems, Suite 22, 5525 Scotts Valley Drive, Scotts Valley, Calif. 95066. 408-438-6922.

Software utilities

Two microcomputer-based utilization and monitoring products are currently available from **Benta**.

Utilog I runs on the IBM Personal Computer, PC XT, AT and Personal System/2 as well as compatible systems. It was designed to track how often a computer is actually in use during a given time span.

Utilog I can be installed with logon and logoff capabilities, and user names and passwords can also be created. Utilog I is available in a 5¼-in. format and costs $49.95.

Utilog II is a printed circuit board and program for monitoring computer use that can be installed in IBM PC XTs, ATs, PS/2 Model 30s and compatibles. The monitor alternately provides the amount of time individually used by the printer, keyboard, disk and communications ports. A real-time clock is also included. Utilog II costs $195.

Benta, 12708 E. 62nd Court, Kansas City, Mo. 64133. 816-353-3765.

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Training

A courseware program for Lotus Development Corp. 1-2-3 users is available from the **American Management Association (AMA).**

A Manager's Guide to Financial Analysis Using 1-2-3 is a self-study program that teaches the user to build and analyze income statements, balance sheets and cash flow and checking account models.

The course includes a 1-2-3 manual and an instructional data disk and operates on IBM Personal Computers or compatible computers running IBM's PC- or Microsoft Corp.'s MS-DOS.

The courseware costs $165 for AMA members and $175 for nonmembers.

American Management Association, 135 W. 50th St., New York, N.Y. 10020. 518-891-5510.

Microvideo Learning Systems, a producer of video-based training programs for personal computer hardware and software, has developed a two-part training program for Wordperfect Corp.'s Wordperfect 5.

The **Wordperfect 5 Learning Systems** consist of two modules: one for new users and one for more experienced users of the word processing software. The new-user module includes coverage of the basic applications, such as writing, editing, printing and formatting. The more seasoned user will learn advanced applications, concentrating primarily on desktop publishing capabilities.

The Wordperfect 5 Learning Systems may be purchased together for $795 or separately for $495 each.

Microvideo Learning Systems, 119 W. 22nd St., New York, N.Y. 10011. 800-231-4021.

Data storage

Laserdrive Ltd. has expanded its product line with three optical disk drives for Apple Computer, Inc. Macintosh II, Digital Equipment Corp. Microvax II and IBM Personal System/2 environments.

The three write-once read-many optical disk subsystems — the **Model 820, Model 840** and **Model 850** — complement the vendor's existing Model 810, which was designed for use with systems compatible with the IBM Personal Computer, XT, AT and Intel Corp. 80386-based systems.

All models connect to host systems via a small computer systems interface bus and can be integrated for use as magnetic disk storage devices. Each subsystem provides 810M bytes of storage on a 5¼-in. removable cartridge.

The Model 820 for the Macintosh is $6,995, the Model 840 for the Microvax II costs $9,495, and the Model 850 for the IBM PS/2 is $5,995.

Laserdrive, 1101 Space Park Drive, Santa Clara, Calif. 95054. 408-970-3600.

A tape storage subsystem designed for use with IBM Personal Computers, Personal System/2s and compatible systems has been announced by **Advanced Digital Information Corp.**

The backup system, dubbed the **ADIC Model 400-XP**, provides storage, backup, archiving and data transfer capabilities. The unit can be physically connected to any of the microcomputers via a connector and reportedly weighs less than five pounds.

Backup for PCs, PS/2s

The company is also offering adapter kits, which will allow the tape drive to access the host computer.

The ADIC Model 400-XP costs $890; adapter kits cost $195.

Advanced Digital Information, P.O. Box 2996, Redmond, Wash. 98073. 800-336-1233.

Printers/Plotters/ Peripherals

A mechanical mouse for use with the IBM Personal Computer, PC XT, AT, Personal System/2 and compatible systems is available from **MSC Technologies, Inc.**

The **Omnimouse** is targeted at users who do not require the high degree of accuracy delivered by the company's more sophisticated PC mouse products.

The Omnimouse has a two-button case and 200 char./in. resolution. Support is offered for both mouse systems and Microsoft Corp.'s Windows mouse protocols.

Omnimouse costs $89.

MSC Technologies, 2600 San Tomas Expwy, Santa Clara, Calif. 95051. 408-988-0211.

Amdek Corp., a subsidiary of Wyse Technology, Inc., has added three microcomputer monitors and an enhanced IBM Video Graphics Array (VGA) card to its existing product line.

The vendor claims that its **VGA Adapter 132** gives Amdek's high-end monitors 100% hardware compatibility

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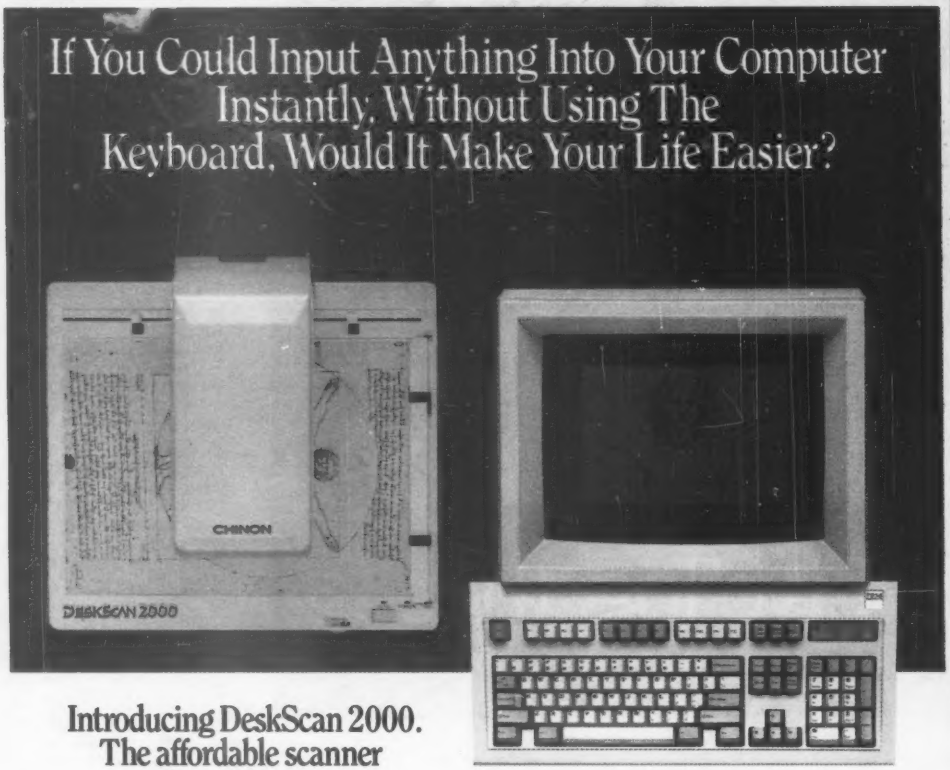
If You Could Input Anything Into Your Computer Instantly, Without Using The Keyboard, Would It Make Your Life Easier?
CHINON
DESKSCAN 2000

Introducing DeskScan 2000. The affordable scanner from Chinon.

Chinon's unique new scanner could change forever the way you use your computer. With OCR software, it scans, digitizes and inputs text into your computer so that you can edit it with almost any word processing software. That means no more retyping of documents. Just think how much time that could save you and your staff!

DeskScan 2000 also scans images, so that you can input graphics too. Then you can manipulate these images with desktop publishing or graphics software.

Best of all, DeskScan 2000 is much lower priced than most effective scanners. That means it's finally cost-effective to put a scanner on every PC user's desk.

DeskScan's unique overhead scanning design means that you no longer have to separate pages from documents to feed them through a scanner. The document stays still while the scanning head *"reads"* the page. And the unit automatically adjusts for room lighting levels.

Scanners aren't just for desktop publishing any more. DeskScan 2000 becomes an economical FAX, with the simple addition of an inexpensive add-in board. Chinon sells this exciting option and others in package combinations of bundled hardware and software—so that you have an affordable way of getting started with your scanner right away.

So see for yourself what DeskScan 2000 can do for you. Call TOLL-FREE 1-800-441-0222 TODAY for the DeskScan 2000 dealer nearest you.

CHINON

Chinon America, Inc., 660 Maple Ave., Torrance, CA 90503

Continued from page 44

with VGA standards, as well as software compatibility with earlier IBM Color Graphics Adapter, Enhanced Graphics Adapter and Hercules Computer Technology, Inc. standards.

The card can be installed in IBM Personal Computers, PC XTs, ATs and compatibles and Intel Corp. 80386-based DOS microcomputers.

The 14-in. **Amdek Monitor/632** features a VGA screen and is suited for business graphics and desktop publishing applications. Used in conjunction with the VGA Adapter 132 card, the product reportedly supports all VGA models, including those with 640- by 200-, 640- by 350-, 640- by 480- and 720- by 400-pixel resolution. The monitor is capable of displaying 256 colors on a screen simultaneously.

The **Smartscan** multifrequency monitor is said to offer 15- to 35-KHz horizontal scan frequency and supports all VGA functions. It has a maximum of 800- by 600-pixel resolution and supports Microsoft Corp. Windows, Digital Research, Inc. Gem and Autodesk, Inc. Autocad applications.

A monochromatic monitor, the **Amdek Monitor/201A,** is available to address the needs of the low-end market. The 12-in. unit features an amber display and is appropriate for word processing, spreadsheets and other applications.

The 201A costs $129. Suggested retail prices for the Amdek Monitor/632 and Smartscan are $595 and $795, respectively. Pricing for the VGA Adapter 132 has not yet been determined.

Amdek, 1901 Zanker Road, San Jose, Calif. 95112. 408-436-8570.

A dual-page display screen for the Apple Computer, Inc. Macintosh has been introduced by **Nutmeg Systems, Inc.**

The monitor reportedly permits the user to view two complete pages when writing, editing or preparing a layout.

Called **Nutmeg 19**, the unit provides 79 dot/in. resolution in a 1,024- by 768-pixel display and a full 11- by 14-in. horizontal format. A proprietary video interface is included, which provides upgrade capability from the Macintosh SE to the Macintosh II, while retaining the original monitor.

The Nutmeg 19 costs $1,899.

Nutmeg Systems, 25 South Ave., New Canaan, Conn. 06840. 203-966-3226.

A hand-held image scanner for use with the IBM Personal Computer AT and compatibles has been announced by **Mitsubishi Electronics America, Inc.**

The **MH 216** scanner was developed for desktop publishing and optical character recognition applications and is said to allow users to scan logos, diagrams and selected sections of memos.

The unit reportedly scans images at a rate of 10 page/min. and offers 200 dot/in. resolution. Scanning width is 8½ in., and an automatic paper feeder is available for use with the product.

The MH 216 costs $995. The optional paper feeder costs $260.

Mitsubishi Electronics, 991 Knox St., Torrance, Calif. 90502. 213-515-3993.

E-Machines, Inc. has announced price reductions on its line of large-screen monochrome monitors.

Effective immediately, the suggested retail price for **The Big Picture** for Apple Computer, Inc.'s Macintosh 512, Mac Plus and Mac SE is $1,695, and the Big Picture for the Mac II is $1,795.

The monitor offers a 1,024- by 808-pixel desktop. Each is shipped as a complete system that includes monitor, video controller card, cables and software.

E-Machines, 9305 S.W. Gemini Drive, Beaverton, Ore. 97005. 503-646-6699.

Board-level devices

A display controller plug-in board capable of three-dimensional computer-aided design on an IBM Personal Computer AT is out from **Nth Graphics Ltd.**

The **Nth 3D Engine** combines parallel processing architecture, hierarchical management of a graphics display list and an object-oriented software interface. Standard models include a graphics tool kit, 2M bytes of display-list random-access memory, 1,024- by 768-pixel resolution and a selection of 256 colors from a palette of 4,096.

The Nth 3D Engine costs from $5,995.

Nth Graphics, 1807-C W. Braker Lane, Austin, Texas. 78758. 800-624-7552.

The Complete PC, Inc. has announced the **Cfax/9600** board, a hardware and software system.

The product reportedly works in background, allowing it to send and receive facsimiles without interrupting personal computer programs. Scanner support includes machines from Hewlett-Packard Co., Microtek, Inc. and Dest Corp.

An on-board scanner port is available for **The Complete Hand Scanner**, a hand-held device for entering logos, signatures or artwork.

The Cfax/9600 costs $599. The Complete Hand Scanner costs $199.

The Complete PC, 521 Cottonwood Drive, Milpitas, Calif. 95035. 408-434-0145.

A series of Intel Corp. 80286-based add-in cards for IBM and compatible personal computers have been announced by **Our Business Machines, Inc.**

The **OA-Link 286** product line was designed to provide IBM Personal Computer AT capabilities and incorporates a

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NEW FROM
JDS MICROPROCESSING
HYDRA SNA

A Direct Channel Attached
Protocol Converter/Controller
FEATURING SNA SUPPORT

JDS MicroProcessing proudly announces a new addition to their direct channel attached line of protocol converter/controllers.... HYDRA SNA.

HYDRA SNA offers full SNA support allowing ASCII terminals, PCs, and printers to be interfaced directly into an SNA network.

HYDRA SNA provides 3270-type emulation for ASCII terminals and PCs, supports many popular ASCII terminals, and offers key mapping facilities allowing additional terminals to be supported. HYDRA SNA supports local and remote applications and provides password, call-back, and positive logoff security.

HYDRA SNA features quality design that provides outstanding performance for connecting devices and offers flexibility that incorporates quick set up for normal operations and an easy to use configuration facility.

HYDRA SNA is available in 8-port increments from 16 to 64-ports. The design features easy expansion enabling models to be upgraded up to a total of 64-ports. HYDRA SNA attaches to IBM and compatible 360/370/30XX/4300 mainframes.

For full details Call 800-55-HYDRA. In California call (714) 770-2263.

JDS MICROPROCESSING
22561 Lambert Street, Suite 206, El Toro, CA 92630

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What computer users can learn from the Chinese warlords.

When the computer industry was first born, its propagators set up individual fiefdoms, much like the ancient Chinese warlords.

Each company staked its claim in different ways, but each ensured that its customers would remain indentured.

How?

Because Company X computers worked only with other Company X computers. Because Company Y computers communicated only with other computers from the same vendor. And because the technology to open up these barriers was either too complicated or too expensive.

But like the reign of the Chinese warlords, the computer monopoly also is coming to an end at the hands of progress.

Today's users are demanding openness. They want to move data easily among dissimilar computer systems, to take an application from one computer and run it on another. They want to choose products based on what they need and how well it serves their

UN

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purposes, not because it's the only option.

This openness will fundamentally change the computer industry. And because so much is riding on our ability to meet this challenge, it is crucial that it be met intelligently, aggressively.

Perhaps there is something to learn from the fate of the Chinese warlords.

The information processing industry is feuding over two sets of standards for openness. This is a disgrace.

The need for openness and user interest in it should come before the selfish interests of vendors trying to protect their schemes.

The issue isn't whether AT&T's UNIX® prevails over the newly formed Open Software Foundation's.

The issue is that open systems are not a figment of some consultant's imagination. They are a fact.

The issue is that even users of proprietary systems benefit from open systems because of greater access to new and more plentiful applications.

The issue is that this is a great opportunity for the computer industry to band together to encourage progress and shape it for the greater good.

And finally, the fact is that unless we all do it together, history proves how disunity is the quickest formula for failure.

If you think a unified UNIX® standard is important, tell your computer company. There's no time to lose and everything to gain.

iSYS

The power of ^{2}

Continued from page 45

CPU, random-access memory and video technology onto one board.

The product is packaged in an interface box for connection to a monitor, keyboard and proprietary operating system. Up to 200 feet of cabling are included. All systems are Microsoft Corp. MS-DOS and IBM PC-DOS 3.3 compatible.

The OA-Link 286 product line starts at less than $1,500. IBM Enhanced Graphics Adapter functions are optional.

Our Business Machines, 12901 Ramona Blvd., Irwindale, Calif. 91706. 800-443-1435 or 818-337-9614 (Calif.).

An Intel Corp. 80386-based IBM Personal Computer AT cache board design and documentation package has been announced by **Austek Microsystems Proprietary, Inc.** The product is for system designers of engineering workstations, network servers and other high-end personal computer systems.

Called **Cobra**, the board is said to incorporate 32K bytes of cache memory using a proprietary controller chip. The design kit includes a technical reference manual, logic schematics and programmable array logic equations. Cobra is designed to maintain compatibility with the AT architecture and can use peripheral expansion cards designed to operate in the AT.

Cobra costs $3,900.

Austek Microsystems, Suite 1020, 444 Castro St., Mountain View, Calif. 94041. 415-960-1315.

Lotus Development Corp. has reportedly added 30 features to its **Signal** software for financial market tracking and analysis.

The personal computer-based information service was designed to provide independent investors with real-time, up-to-the-second market information. **Release 2.0** incorporates 60 additional indexes, bringing the total number to 80, and the program includes comprehensive coverage of the AMEX and NASDAQ stock exchange indexes.

Additional enhancements are said to include support of up to 1,250 stock symbols. Lotus uses FM sideband technology to transmit market information to subscribers in 14 U.S. metropolitan areas.

Signal users may upgrade to Signal 2.0 for a $55 handling charge. Signal software and the FM receiver cost $595. The monthly Lotus subscription fee is $80 with a supplemental monthly fee for each exchange received.

Lotus, 55 Cambridge Pkwy., Cambridge, Mass. 02142. 800-367-4670.

Users of **Decision Graphics, Inc.'s Directory of Micro Engineering and Software/Services** can now use a data base tool that will help locate computer-aided design and engineering packages.

Called the **Software Locater**, the personal computer-compatible data base serves as an intelligent index to the directory service. The product uses an interactive search technique to aid users in locating packages and provides a brief description of each selected package. A full, detailed description is then referenced in the directory, which reportedly lists more than 800 software descriptions covering 27 application areas.

The Directory of Micro Engineering Software/Services costs $189 per year. The Software Locator is available for a one-time fee of $65 with the purchase of a one-year directory subscription or is included at no extra charge with a two-year subscription.

Decision Graphics, Suite 652, 555 Sparkman Drive, Huntsville, Ala. 35816. 205-837-7710.

Auxiliary equipment

Two data security products for IBM Personal Computers and compatibles and IBM Personal System/2s have been introduced by **Qualtec Data Products, Inc.**

PS/2-Lok is a metal locking device designed to control access to the power switch of the PS/2 Model 50. The lock requires a key to turn system power on or off. The product is secured to the PC with a retainer plate and can be installed without modifying the computer cabinet. An optional keying feature provides security officers and corporate management with overall access control.

PS/2-Lok costs $49.95.

File-Guard is a software program that reportedly allows the user to select and lock confidential files. The package runs on most Microsoft Corp. MS-DOS-compatible operating systems and is available on 5¼- or 3½-in. diskettes.

File-Guard costs $99.

Qualtec Data Products, 1400 Coleman Ave., Santa Clara, Calif. 95050. 408-496-6184.

A product that can reportedly speed up the math coprocessor on an IBM Personal Computer AT has been introduced by **Symbiotic Technologies.**

The vendor claimed that **Co-Clock** allows the coprocessor to run independently of the motherboard and can subsequently improve the speed and performance of any program that uses the Intel Corp. 80287 chip.

Co-Clock is installed under the coprocessor and takes up ¼ in. of space. No expansion slot is required.

The product is composed of a four-layer glass epoxy board that uses a custom-integrated circuit.

It is available in both 10- and 12-MHz versions.

Co-Clock costs $89.95.

Symbiotic Technologies, Carlsbad Research Center, 2380-D Camino Vida Roble, Carlsbad, Calif. 92009. 619-431-9821.

WHY DO SEVEN OF THE "BIG EIGHT" ACCOUNTING FIRMS CHOOSE REALIA COBOL?

Why Realia? Simple. Because we can help the best *stay* the best.

Realia COBOL is the fastest, most advanced application development tool available to bring the power of the mainframe right to your PC. You'll start saving time, money, and resources, whether you're maintaining an old system or creating a new one.

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Rating

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user's guide and a video display manual. Both books are side tabbed and include an index and a table of contents. The installation instructions are easy to follow.

Ease of use: Good.

Setup: Satisfactory. AT&T bundles DOS, diagnostic and setup software, a utility to change the speed of the microprocessor and EGA drivers with its system. Setting up the 6386E WGS took slightly longer than on most other machines that were tested, probably because you have to remove a cover before you can get to the serial and parallel ports as well as keyboard and monitor connections.

Workmanship: Very good. The 6386E WGS motherboard had no last-minute wiring or component additions. Layout and mechanical design surpassed that of many other systems. The case is huge (24-in. high, 17-in. deep and 9-in. wide), well-built and appeared durable.

Support: Policies — Satisfactory. Technical support — Very good. AT&T offers a one-year warranty on the 6386E WGS. Repairs are handled by the vendor or authorized dealers. On-site repair service and extended warranties are available. Technical support is available 24 hours a day, seven days a week on a toll-free line. AT&T requires users to provide the system's serial number before they are able to receive technical support.

Value: Good. At $12,887 with a 135M-byte hard disk, 4M bytes of RAM, an EGA board and a monitor, the AT&T system was the most expensive unit tested. For the money, you get a large drive, high-end speed scores and excellent expandability.

• IBM PS/2 Model 80-111

The IBM name traditionally means a well-built and solid performing system, and it seems the 20-MHz Personal System/2 Model 80-111 is no exception to that.

Performance: The Model 80 clocked a very good CPU speed. The system's 115M-byte ESDI hard disk earned very good scores in hard-disk sequential and random access.

Compatibility: Software — Very good. Hardware — Poor. All the programs in our software test suite ran fine on the Model 80. Because of the Micro Channel architecture, however, we were unable to run our hardware test suite.

Expandability: Very good. The lock on the Model 80 secures the case but not the keyboard. There are eight Micro Channel expansion slots on the machine.

Documentation: Very good. Documentation for the Model 80 includes clear step-by-step instructions for novices. The diagrams are clear and match the hardware. A troubleshooting section covers symptoms and solutions along with on-line error messages. Information is also included for memory, hard disk, coprocessor and video card installation.

Ease of use: Good.

Setup: Very good. Setup, diagnostics and DOS 3.3 are included with each system. The Model 80 was virtually a breeze to set up.

Workmanship: Very good. The motherboard on the Model 80 was perfectly clean. All the components are surface mounted for an impressive looking layout. The external case is sturdy and solid.

Support: Policies — Satisfactory. Technical support — Good. IBM offers a one-year warranty on the Model 80. Repairs are handled through authorized dealers. There are no optional support plans offered, but an extended warranty is available to users. Technical support is available only through authorized dealers. We called two dealers and on both occasions received accurate and helpful support.

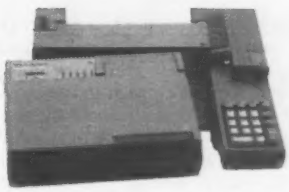
Value: Satisfactory. For its $11,590 price tag, the 20-MHz PS/2 Model 80-111, which features a 115M-byte hard disk, 2M bytes of RAM, a VGA board and an IBM 8512 monitor, offers fairly standard performance. Like the HP Vectra, the Model 80's large hard disk improves its score.

TI's new TravelMate™ LT220.
It's the closest thing to carrying a VAX™ in your briefcase.

Texas Instruments introduces the LT220 lap-top terminal — the next best thing to being there when you need remote access to your company's VAX.

The LT220 provides full VT220 emulation in a 4.8-lb. package, without sacrificing functionality. It features a 25-line screen that's easy to read. It even has a full-function keyboard like the one on a VT220.

The terminal communicates at 1,200 or 2,400 bps through one of its optional internal modems. For hard copy, just slide the LT220 into one of its optional cradles to add an ink-jet or thermal printer.



New credit-card-sized memory cards let you create, update and store files. They're also handy for programming the LT220 to your specific application.

Like its Silent 700™ predecessors, the LT220 sets new standards for portability, durability and reliability. All of which makes it the perfect tool for anyone who's ever wished for a VAX in their briefcase. In short, this may be the best little terminal in the world.

So go ahead. Take the first step toward improving your productivity today. Call Texas Instruments for more information or to arrange a demonstration of the LT220. **Phone toll-free, 1-800-527-3500.**

TEXAS INSTRUMENTS

36154
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VAX is a trademark of Digital Equipment Corporation.

IBM dot matrix printer goes to work

BY SALLY CUSACK
CW STAFF

IBM recently announced a dot matrix printer designed for use in offices that require a variety of output options, including draft, letter-quality and envelope- and sheet-feed.

Dubbed the Quickwriter Printer, the wide-carriage, 24-wire dot matrix device was described by IBM as a medium-duty printer with letter-quality print that is comparable to the IBM Selectric III typewriter.

The printer has a reported draft speed of 330 char./sec. at 10 char./in. and a letter-quality speed of 110 char./sec. to 188 char./sec. at 10 char./in.

With the optional Selectric font, the printer provides 55 to 60 char./sec. According to Roger Savitt, a senior information representative at IBM, the Quickwriter is the next step up from the light-duty Proprinter X24 and the wide-carriage Proprinter XL24, which have draft speeds of 200 to 240 char./sec.

The company said the Quickwriter's paper handling and envelope options make the product suitable for one-printer offices that require multiple printing capabilities.

Paper handling options include both a single- and a dual-drawer sheetfeed function. The dual-drawer configuration consists of one drawer for letterhead and one drawer for regular bond paper. The design allows documents to feed out sequentially; in a top, bottom and then envelope mode, which prints envelopes automatically.

"In the past, the 24-wire Proprinters couldn't handle envelopes, and other printers required manual head adjustments," Savitt said, adding that the Quickwriter will adjust the printhead to fit the envelope without operator intervention.

The unit measures 7.4 by 21.6 by 14.3 in. Programmable features include line spacing, quiet mode and line width.

SCIENCE/SCOPE®

A new printed wiring board (PWB) significantly reduces the manufacturing cost of large backplanes, or motherboards, while improving producibility, performance, and reliability of the computers they help operate. Developed by Hughes Aircraft Company for military computer applications, the 18-layer PWB contains 7,500 fewer wires than the one it is designed to replace, and may be the most complex such board ever manufactured. The multilayer design of the new board minimizes the number of machine-wrapped wires, requiring only 2,500 such wires, compared to 10,000 on present PWBs, thus greatly simplifying assembly and inspection.

Photographs that show features one three-thousandth the width of a human hair have been obtained through the latest advances in miniaturization technology. The photographs were achieved with a microscope using a focused ion beam that scanned nickel crystals at 80,000 times their actual size. The images revealed features as small as 15 nanometers, equivalent to approximately 100 diameters of an atom. Used as a fabrication tool, the focused ion beam can produce the structures required for ultra-small microelectronics. The technique, developed by Hughes, will be used in applications for ultra-small structures to produce improved microwave sources and amplifiers, faster integrated circuits, higher speed photodetectors, and new devices utilizing superconductive materials.

A new technique for interconnecting high lead-count integrated circuit (IC) chips to a substrate or package is being developed as a software and hardware package in a single piece of equipment. Called single-point Tape Automated Bonding (TAB), the Hughes system uses an etched tape, typically formatted in 35-mm or 70-mm sizes, on which a specific IC pattern is etched out. A polyimide film is used to separate and support the leads used for the interconnects. Single-point TAB combines the speed and precision of tape-automated bonding with wire bonding's ability to handle a wide variety of chip shapes, including the latest very large-scale integrated chips.

An infrared sensor system for the joint services' V-22 Osprey aircraft will help crews navigate and land in darkness and during periods of poor visibility. The Infrared Detection Set (IDS), developed by Hughes, senses small differences in radiated heat and provides a TV-like image of the surrounding area. The V-22, the first of the new tilt-rotor aircraft for the U.S. Armed Forces, is able to take off and land like a helicopter, but fly like a plane. Hughes will start flight testing the IDS in early 1989, with flight test support continuing through 1991.

Hughes Ground Systems Group is applying its airspace management experience to the exciting challenges of worldwide air traffic control. These systems will be designed to ensure service 24 hours a day, 7 days a week. They will support distribution of processing among multiple computers linked via local area networks. The many challenges include design and development of hardware and software to support advanced display and man-machine interface technology, and using satellite technologies for future ATC applications. To help design the next generation of air traffic control systems, send your resume to Hughes Ground Systems Group, Employment Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

For more information write to: P. O. Box 45066, Los Angeles, CA 90045-0066

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HUGHES

Subsidiary of GM Hughes Electronics

Cobol

FROM PAGE 35

our emphasis on C or Basic but a renewed emphasis on Cobol," said Greg Lobdell, group product manager at Microsoft's languages group. Lobdell added that Microsoft had been condemned for putting Cobol development on the back burner. But no more.

Microsoft has been upgrading its Cobol once every year and half or so and saw its technology surpassed by a variety of vendors. Enter Micro Focus. "We looked around at the technology, and Micro Focus was as good as any we found," Lobdell said.

According to Microsoft, the advent of Intel Corp. 80386-based computers, the OS/2 large-memory operating system and better versions of Cobol will lead to a boom in the market. And most users will be MIS/DP professionals using micros to develop and maintain mainframe applications.

Never fear

While some Microsoft Cobol users may be concerned about migrating to the Micro Focus product, Lobdell said not to worry. "That is one reason we went for Micro Focus. They support nine different dialects of Cobol."

The only hitch may be for users moving applications from OS/2 or MS-DOS to Xenix. The Micro Focus Cobol does not currently support Xenix, but Micro Focus is committed to making such a product available, Lobdell said.

Under terms of the agreement, Microsoft will market and relabel the Micro Focus Cobol for MS-DOS and OS/2, and Micro Focus will sell add-on tools that support mainframe necessities such as IBM's CICS.

The two firms will also share technology, with Micro Focus providing the core Cobol and Microsoft kicking in tools such as its editor, linker and, eventually, its Codeview programming tool.

Microsoft Cobol 3.0 is currently available and costs $900.

Barney

FROM PAGE 35

In order for these firms to succeed, they need to act like PC companies and create a separate organization, much like IBM did with its Entry Systems Division.

After developing and marketing good, solid, well-priced systems, these organizations can then go on to add features that make the micros a better fit with the host environment, much like IBM will do with OS/2 Extended Edition. Get the message?

Lotus vs. *The Boston Globe*. Lotus has gotten used to facing battles in the marketplace arena. Now the company is fighting with a large press organization as well.

The Boston Globe has irked Lotus chairman Jim Manzi with its less than nice treatment of the company. The last straw was at Lotus Week, when a *Globe* editor misinterpreted Manzi's "confession" that he had hoped to have announced the shipment of 1-2-3 Release 3.0.

The *Globe* headline dubbed the confession as another Lotus delay, which it wasn't, and ol' Jim hit the roof. The word went out. No communications with the *Globe* except what Lotus is legally obliged to do.

Now both organizations are going around wearing egg on their faces. Lotus got yolked because the *Globe* increased its negative coverage of the company with cartoons and a scathing column that went so far as to call Lotus "rotten at the head."

But the *Globe* doesn't look too hot either, because to astute observers, much of the negative coverage appears to be in response to the tension with the *Globe* — not based on problems that suddenly emerged at Lotus.

Fortunately, both organizations seem to have shared a washcloth to wipe the egg off, and many of the problems have been smoothed over.

Language lawsuit lament? Now that Oracle has announced its intention to ship a clone of Ashton-Tate's Dbase and zillions of companies are cloning Adobe's Postscript page description language, some believe it is only a matter of time before someone sues to protect a computer language.

We hope it never comes to that, but if it does, watch out. Like suits over interfaces, these babies could spiral out of control, because nobody really knows who developed these languages in the first place.

PC bigots discover the mid-range. If you're looking for some good yuks, just take a look at how the PC trade publications covered IBM's Application System/400 announcement. These pubs, which have ignored anything that doesn't begin with the word "PC," discovered there is indeed life beyond micros.

Now, they say, we have a machine that serves as a bridge between micros and mainframes. Also, the AS/400 could act as a server for PC LANs. Jeepers! This is something new? These stories make all existing minicomputers sound like chopped liver.

Ashton-Tate and third parties — hatred as usual. Ashton-Tate has never really gotten along with Dbase aftermarket firms. And this situation shows no signs of improving.

The latest skirmish involves competitive conferences. Ashton-Tate is holding a Dbase conference to which no third parties have been invited. Dbase third parties are also holding a conference — which Ashton-Tate has declined to attend.

Damn DRAM. The shortage of memory chips has even hit Microsoft, which needs a slew of boards for compatibility testing of software.

Greg Lobdell, product manager at Microsoft's languages group, found out the hard way that the shortage is indeed real.

It seems Lobdell was out of town on business, as product managers often are. When he returned to work, he discovered that some Microsoft employees had gone into his office, popped the case off his PC and ripped out his Cheetah board.

That's what locks are for, Greg.

Barney is *Computerworld*'s senior editor, microcomputing.

Symantec tries new orchards, eyes Apple

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Symantec Corp. has continued to widen its scope outside of the personal computer market with the introduction of five new or enhanced software products for Apple Computer, Inc.'s Macintosh. The products are all slated to ship before the end of the year.

Introduced were More II, a desktop presentation product; Inbox 3.0 for electronic mail; Lightspeed-C Version 3.0; Lightspeed Pascal Version 2.0; and Just Enough Pascal for programming.

Four of the products were developed by Symantec's Think Technologies division, and More II was developed by Symantec's Living Videotext, Inc. division.

More II, which costs $395, allows Mac users to create desktop presentations. It includes word processing, drawing and outlining capabilities. The product is scheduled to be available in the third quarter of this year.

Inbox 3.0 is an enhancement of an existing E-mail package for the Macintosh. It adds message center architecture, which allows it to run on Mac file servers, including Tops and Appleshare. The product also allows connections to PC environments.

The price of Inbox 3.0 has not been set. It is scheduled for release during the fourth quarter.

Think's Lightspeed-C 3.0 is a C development environment for the Macintosh that adds a Mac-style source-level debugger, precompiled headers, an in-line Motorola Corp. 68881 math coprocessor and support for Motorola's 68020 microprocessor. Lightspeed-C 3.0 is currently shipping at an introductory price of $175.

Think's Lightspeed Pascal 2.0 adds an in-line 68881 math coprocessor and 68020 support to the original product. Shipment is scheduled for the third quarter of this year at an introductory price of $125.

A learning tool

Just Enough Pascal is a learning tool designed to accompany Lightspeed Pascal 2.0 in teaching users to build an application in that environment. Instructions are on-line and interactive.

The product's price is $75; shipment is scheduled for the third quarter.

Symantec, a developer of applications software for IBM Personal Computers and compatibles, first entered the Macintosh market with the acquisition of Living Videotext last July.

The company increased its presence with the purchase of Think Technologies shortly afterward. Company officials declined to project sales levels for the firm's Macintosh products.

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DATA STREAM

Clare Fleig

SNA skills fuel buy-outs

It was not too long ago that the handful of recognized third-party Systems Network Architecture (SNA) developers toiled in relative obscurity. Now there is big demand for non-IBM companies with SNA expertise that can help MIS departments, not to mention other vendors, implement key IBM networking protocols such as LU6.2.

SNA software development houses such as Communications Solutions, Inc. (CSI), Rabbit Software, Softswitch and Orion Network Systems were known to some of the major computer vendors but to few others.

Boy, have things changed. Today, SNA developers have not only become more visible in this merger- and acquisition-hungry communications environment, they have suddenly become hot properties.

In virtually back-to-back moves, Orion and CSI changed hands. The latter was purchased by 3Com, and Orion was bought by its biggest client, Apple.

In a separate move a few months ago, Tandem purchased an equity investment in another SNA house, Netlink, a Raleigh, N.C., company whose development team includes some of the original SNA architects.

These purchases are much more than just another indication of consolidation fever; they

Continued on page 56

Micro Channel hits modems

Companies ignore user ambivalence, bet on need for IBM architecture

BY JAMES DALY
CW STAFF

IBM's high-speed Micro Channel architecture bus created a big splash when it arrived on high-end Personal System/2 models last year, and the ensuing wake has vendors scrambling to introduce internal modems designed to tap the greater capabilities of the new design.

Although the implementation of the design has drawn mixed signals from a user community laden with standards, a *Computerworld* survey revealed that several modem makers have entered the still-uncertain market in earnest.

Firms such as U.S. Robotics, Inc., Hayes Microcomputer Products, Inc., Telebit Corp., Racal-Vadic, Ven-Tel, Inc., Paradyne Corp., Ark Electronic Products, Inc. and London-based Dataflex Design Ltd. have already headed into the waters of Micro Channel compatibility in earnest.

"We think it will be a significant market. That's why we're participating," said Connie Bridgham, a spokeswoman for Atlanta-based Hayes, whose 2,400 bit/sec. Smartmodem 2400P is slated to be available this month.

Quicker response

IBM's decision to create the Micro Channel architecture was driven by the need to make its machines run faster and more efficiently.

The new bus is said to allow the systems to run from two to 3½ times faster than IBM's earlier Personal Computer line and affords better multiprocessing and multitasking.

Because of these advanced capabilities, modem makers are putting their most powerful foot forward: 2,400 bit/sec. modems seem to be leading the way. Users can also expect to pay more for what is typically a heavily discounted product.

Mark Smith, communications director at Skokie, Ill.-based U.S. Robotics, said his firm put out a version of its high-end 2,400 bit/sec. modem for the Micro Channel "because the PS/2 Micro Channel models are a premium product, and it's our feeling that the market will go for premium add-on products."

Many of the new modems are also attempting to ease their acceptance by offering CCITT V.22, V.22bis and Bell 103/212A compatibility, which constitute the majority of modems both in the U.S. and abroad.

Users picket

Since external modems can serve a wide variety of computer architectures because they connect through a standardized port, most modem makers will not be excluded from the Micro Channel-equipped market. However, sales may be lost to end users who loathe the cables and desk space required for external modems.

The prospect of a late entry into a potentially huge market

Continued on page 56

IBM airs additions to SAA

BY GERARD BIDAL
and AMIEL KORNEL
IDG NEWS SERVICE

LA HULPE, Belgium — IBM revealed further details earlier this month of its blueprint for Systems Application Architecture (SAA), the software project intended to blend its different computer architectures at the application and programming levels.

Speaking at a two-day IBM-hosted European press forum, Earl Wheeler, vice-president and general manager of IBM's Programming Systems Division, announced the following upcoming SAA expansions:

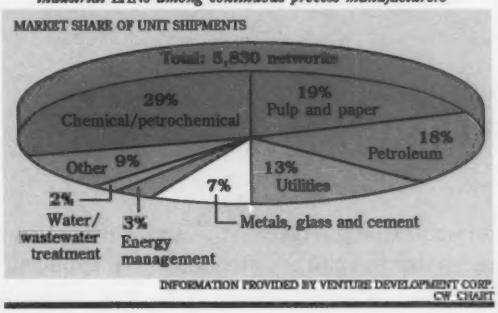
- PL/I will join Rexx, Cobol, Fortran, C, CSP and RPG as SAA languages. Wheeler confirmed that the System/36 and 38 language, RPG, will be implemented across all four SAA oper-

Continued on page 54

Data View

LANs on the factory floor

In 1987, chemical companies remained the biggest buyers of industrial LANs among continuous process manufacturers



INFORMATION PROVIDED BY VENTURE DEVELOPMENT CORP.
CW CHART

Mergers fuel more service

BY KATHY CHIN LEONG
CW STAFF

Networking vendors that have merged with larger companies during the last year recently issued guarantees to supply increased service and support to their customers. Among the benefits users were promised are better pricing, faster service, improved service policies, more support sites and a wider choice of products.

Some companies have already acted. For example, Fox Research, Inc., which was acquired by Atlanta-based Digital Communications Associates, Inc. (DCA) last August, has used its parent's resources to continue providing free technical sup-

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Inside

- Choose a TCP/IP-to-OSI vendor. Page 54.
- MCI International reaches out with dual-line service to Europe. Page 57.
- Westford hosts a Reunion. Page 60.

Advice on Integrating IBM, DEC, HP, & Unisys Networks

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Linking TCP/IP to OSI

BY ELISABETH HORWITT
CW STAFF

As the ISO's Open Systems Interconnect (OSI) protocols at last show signs of maturing, Transmission Control Protocol/Internet Protocol (TCP/IP) installations are increasingly looking to vendors for a smooth migration path to the OSI networking standard.

Such companies want their existing TCP/IP installations to be able to talk to the new OSI networks during the transition stage.

Vendors have only just begun to come out with gateways that translate between the two protocols at the application level — for example, between OSI's electronic mail protocol, X.400, and TCP/IP's Simple Mail Transfer Protocol (SMTP).

The following is a list of some current products and upcoming introductions in this area:

• **Sun Microsystems, Inc.** in Mountain View, Calif., offers a gateway that reportedly allows Network File System, its TCP/IP-based networking system, to perform basic file access and storage functions on an FTAM system.

• **Sydney Development Corp.** in Vancouver, B.C., said it provides gateways to systems running TCP/IP's SMTP, as an option on its Messenger 400 X.400 electronic mail system for Unix systems. The product reportedly allows users to implement X.400 on top of either a TCP/IP or an OSI network. Sydney said it plans to provide a gateway between OSI's FTAM to TCP/IP's File Transfer Protocol (FTP) on a contractual basis initially, with a possible commercial product out in the future.

• **Network Research Corp.** in Los Angeles said it plans to release a gateway between SMTP and X.400 by year's end. A gateway between TCP/IP's FTP and FTAM is slated for release in mid-1989. Also planned is a product in late 1989 that would allow TCP/IP applications to run over OSI networks.

• **Wollongong Group, Inc.**, located in Palo Alto, Calif., has announced — but not yet delivered — a bridge that supports OSI and TCP/IP. It also plans a gateway between TCP/IP and OSI applications at an undisclosed time, a company spokesman said.

• **Retix Corp.** in Santa Monica, Calif., said it is planning a fall introduction for Retixmail 400, an X.400-based E-mail system said to allow IBM Personal Computers on a TCP/IP network to communicate using X.400. The product consists of an intelligent board that converts one PC into a server that permits other PCs on the network to either exchange E-mail or send it to a long-distance X.400 E-mail service, according to Retix President Andy de Mari.

A second product, slated to be announced several months later, will implement FTAM on TCP/IP. Retix also plans to announce in 1989 a TCP/IP-to-OSI gateway incorporating full sets of both protocols.

• **Ungermann-Bass, Inc.**, located in Santa Clara, Calif., said it will introduce a transport-level gateway in the fourth quarter that will enable the same networking application to run on both TCP/IP and OSI networks.

SAA

CONTINUED FROM PAGE 53

ating systems — OS/2, OS/400, VM and MVS.

• IBM is preparing language and support facilities for developing expert systems under SAA. For these applications, PL/I will serve as an intermediate language to translate the system's knowledge rules. SAA implementations of the fourth-generation languages LISP and Prolog are also being developed.

• SAA will provide an integrated family of application development tools that will "share the same, precisely defined programming objects in a common repository," Wheeler claimed. The repository would be used not only in conjunction with DB2 but also on the recently announced Application System/400 mid-range series of products and on the Personal System/2.

• IBM is working in cooperation with several major software houses to define specifications for computer-aided software engineering tools based on the common repository.

SAA of the future

Wheeler and other senior IBM officials at the conference emphasized that both Unix and Open Systems Interconnect communications protocols will be integrated into SAA. Wheeler specified that in the future, AIX workstations will be able to connect to the AS/400, an SAA system.

Although he did not specify release dates for the new features, Wheeler projected that 65% to 70% of all the elements of the unified architecture will be in place by 1989, with the rest being filled in by 1990.

In a related development, Ellen Hancock, vice-president and general manager of IBM's Communications Systems Division, said the firm has applied for membership to the X/Open group, a multivendor association promoting a common applications environment for Unix.

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Study: EDI beneficial for users, not vendors

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — The trend toward automated trading, or electronic data interchange (EDI), will be a boon for users but only a modest money-maker for network and translation software vendors because of a price war, according to a recent report.

The report, by Forrester Research, Inc., a market research firm located here, is based on interviews with 26 EDI users, 11 of which had full-fledged EDI systems. The other 15 were in pilot stages. As such, the report provides a snapshot of EDI activity and trends in the Fortune 1,000.

Of those interviewed, 66% are using EDI now, 18% said they plan to implement EDI within the next three years, and another 16% reported no specific plans. A mainframe approach to EDI is used by 84% of current users. Some of these, 31%, also use microcomputers, and only 7% rely on minis.

Based on reactions from these 26 sites, Forrester is estimating that only half of the Fortune 1,000 transmits documents electronically with their trading partners. But because 81% of those request or require their suppliers to transmit via EDI, its use is expected to grow rapidly.

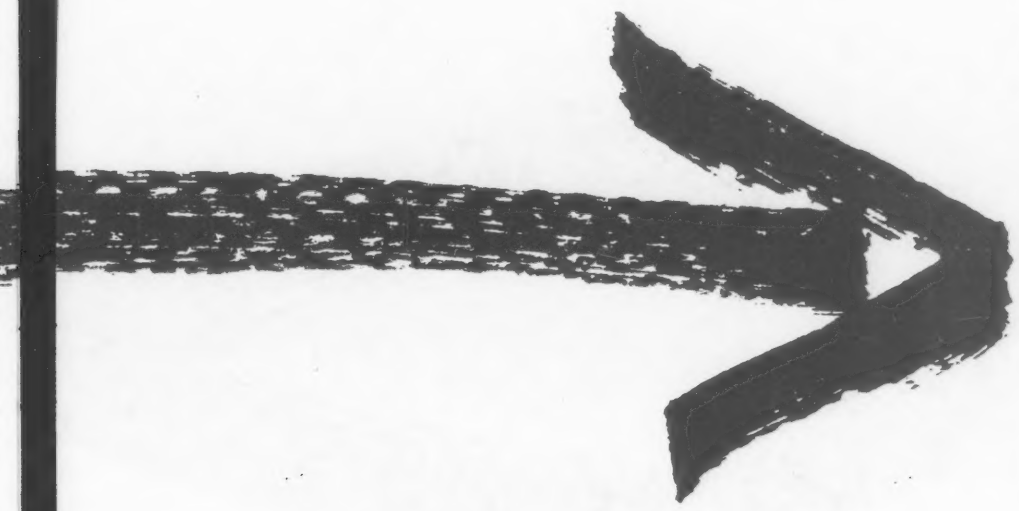
"The firms that benefit from EDI are those who will drive the market by persuading their suppliers to use it," the report said.

Nevertheless, EDI network services vendors will find themselves without defendable competitive positions. Forrester said it expects a price war among third-party network providers, beginning with McDonnell Douglas Corp.'s Aug. 1 elimination of gateway charges. Others will soon follow suit.

To bolster profits, third-party providers have tried to tie users into their networks with their translation software. But smart users are end-running that tactic by buying translators from network-independent vendors, said Mary Modahl, a research analsyst with Forrester. "That way, [users] are not locked in," Modahl said.

Not only will EDI profits generally be modest, but the report warns against looking to EDI to sell hardware. Interviews with Fortune 1,000 users indicated that they will not buy specific systems based on EDI capabilities alone.

"System vendors will have to offer integration of EDI with their office systems as a matter of course," Modahl said. "It's not that someone will buy your computer because it does EDI but rather that they won't if it doesn't."



this environment such a hit with users, system builders and application developers. But IBM has taken it further, adding special enhancements that make AIX the one system to build on.

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IBM. The Bigger Picture

Mergers

CONTINUED FROM PAGE 53

port and service for the lifetime of its products. Just prior to the acquisition, Fox, now called 10-Net, was being pressured to charge for such services because of costs, according to Arnie Lapinig, 10-Net's vice-president of marketing.

In addition, 10-Net will be integrating its products with T1 multiplexers, micro-to-mainframe software and personal computer communications software offered by other DCA subsidiaries, Lapinig said.

A natural thing

Integrating product lines is a natural move for newly acquired companies and a plus for users who need a solid migration path. John Hollinger, MIS director at AIG Corp. in Manchester, N.H., has already reaped the benefits of the 3Com Corp. and Bridge Communications, Inc. merger.

"It has turned out to be of value for us, because we have more access to experts in other areas of networking we didn't have before," he said. By complementing its own PC-oriented networking line with Bridge's high-end products, 3Com will be able to help AIG implement an overall networking strategy, Hollinger said.

Users of local-area network gear from Ungermann-Bass, Inc., which was recently acquired by Tandem Computers, Inc. are crossing their fingers and hoping that Tandem's excellent technical support in will rub off on Ungermann-Bass.

"Ungermann-Bass service is fair, not great. At times, it seemed they would take forever to get back to us when we had a problem," said Marvin Rahm, a telecommunications consultant at Dow Chemical Co. in Midland, Mich.

According to Mike Gardner, vice-president of marketing at Ungermann Bass, his company's network boards will eventually be available at Tandem's nationwide "logistic centers," which currently carry spare Tandem computer parts.

Price cuts are another benefit that some recently merged companies plan to offer. At the newly expanded 3Com, users can get both 3Com LAN and Bridge wide-area network products at discounts of up to 20%. "We are one consolidated company now," said John Marman, vice-president of sales and marketing. At 10-Net, Lapinig said the company is going to drop LAN prices to be more competitive.

"The whole industry is moving toward consolidation, and that hails good news for users," observed analyst Michael Howard of Infonetics, Inc. in San Jose, Calif.

Fleig

FROM PAGE 53

illustrate the importance small-system vendors are now placing on communications compatibility with SNA.

A number of factors have caused SNA's recent move into the communications limelight. The first is IBM. With the advent of such protocols as Advanced Program-to-Program Communications (APPC) and Advanced Peer-to-Peer Networking, IBM has begun to make SNA more practical for small-systems environments. While important functions are still missing, IBM has begun to let small systems handle some of the functions previously monopolized by the host.

A second major factor is the presence of OS/2 Extended Edition's Communications Manager. When fully implemented by IBM, Communications Manager will have much more in common with SNA networks than it will with standard LAN communications functions.

As developers look toward writing programs for OS/2 Extended Edition, it will become more apparent that SNA expertise is required to create applications that operate effectively in that environment. This fact alone makes companies that understand the ins and outs of APPC a lot more valuable.

Complex links

The third factor is the need to meet more sophisticated networking requirements. Some small and medium-size companies may still need a PC Network-like solution, but MIS departments in large corporations more often need to link networks to each other and to mainframes. All too often, that requires some knowledge of SNA.

3Com, with its new development group supporting both its Bridge Communications division and now CSI, seems particularly well positioned to respond to increasing demands for more sophisticated networking products. The company now has products that span the requirements for simple LAN configurations to large interconnected network environments under SNA.

Apple seems to be out to prove that it is more than a personal computer vendor. Of course, the company has made that promise since October 1985, when John Sculley committed the company to full interface connectivity with the IBM environment. With Orion acting as a full partner rather than a third-party supplier, Apple might finally be able to make good on its more sophisticated PC-to-host connectivity promises.

A fourth factor is the overall industry movement toward systems integration. In the commercial market, as opposed to the federal government market, SNA must usually be contended with in some form or another. It often represents the integrating element — that is, the function, feature or capability around which the project is built.

Companies with SNA development expertise readily available to them are positioning themselves for a future significantly more complex than the LAN environment in which both Apple and 3Com cut their communications teeth.

Fleig is director of systems research specializing in local-area networking and IBM communications for International Technology Group in Los Altos, Calif.

Modems

FROM PAGE 53

does not bother some manufacturers that are content to watch from the shore to see if early investors sink or swim.

"We've done the analysis and engineering preliminaries in terms of how to do it and what it will look like, but we've put our resources elsewhere," said Steven Mullins, product line manager for analog modems at General Datacom Industries, Inc. in Middlebury, Conn. "The demand just isn't there yet."

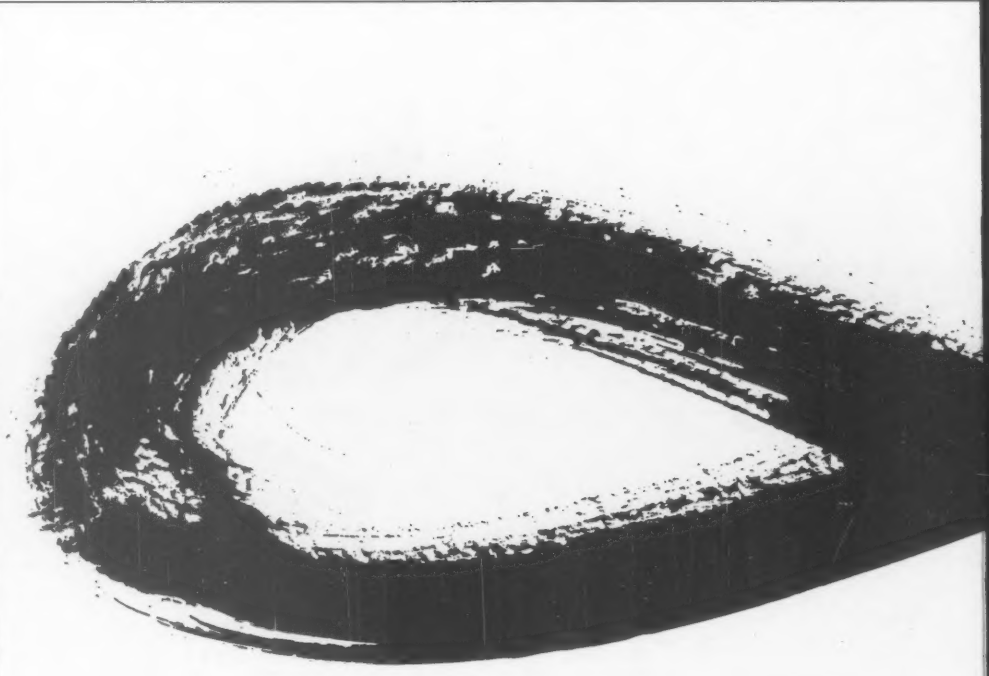
But it will be, according to others, who are confident that where IBM goes, others are sure to follow. "If Commodore had put out the PS/2, I don't think we'd be worrying about Micro Channel-compatible modems," said Eric Arnhum, a data communications analyst at International Resource Development. "But since IBM has developed it, I'd consider it a pretty safe bet."

Hesitation

Still, not everyone is convinced they want to join the fray. "The competition in this new market is already beginning to heat up," said Bill Cormier, an applications engineer in the sales support group at Racal-Vadic, which produces a 1,200 bit/sec. Micro Channel-compatible modem that IBM resells under its own label. "So I think for now, we're pretty happy with our OEM role."

Data communications products makers have also exhibited a historic reluctance to embrace new standards. "Modem manufacturers must continually ask themselves if the standards are going to evolve with the speed that is being professed," said Barry Marks, vice-president of consultant services at Eastern Management Group in Parsippany, N.J. "For instance, why did IBM develop something that is going to be outside of standards like T1 packets, X.25 and ISDN? Where does it fit in?"

Despite the controversy, it seems certain that the capabilities of the Micro Channel are going to take data communications in directions that will be around long after the shouting dies down.



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BIT BLAST

MCI Skyline crosses Atlantic

MCI International, a subsidiary of MCI Communications Corp., has introduced dual-line service between the U.S. and 12 European countries: Ireland, Germany, France, Belgium, Denmark, The Netherlands, Norway, Sweden, Spain, the UK, Switzerland and Italy.

Dual Line allows customers who subscribe to MCI TAT-8 cable service, slated to be out later this year, to lease a backup MCI Skyline international satellite circuit for considerably less than if the services are ordered separately, the firm said. Dual Line requires a three-year commitment, and pricing for it can be combined with special packages from overseas telecommunications administrations.

ACS Network Systems, a supplier of electronic data interchange communications and translation software, has unveiled EDI/400 Management Software for IBM's Olympic Series System for the Application System/400.

In a recent interview, **Novell, Inc.** said it has stopped including Action Technologies, Inc.'s Coordinator electronic mail system in its Netware network operating system, beginning with Advanced Netware Version 2.11.

"There is no end-user mail system in Netware anymore," said Nancy Woodward, president of the firm's Austin, Texas-based development products division.

Woodward said Novell has teamed up with British Telecom International to develop an X.400 E-mail system for Netware because Novell is looking for a gateway for its Message Handling Service into the X.400 world. British Telecom already has an X.400 system — the PC400 — that is compatible with Netware.

Racal-Milgo has announced the Data Communications Disaster Recovery Support Program. The service reportedly provides backup data communications equipment, logistics, manpower and planning assistance to restore network facilities after a disaster. Subscriber networks will be able to resume operation from the disaster recovery site even if the original site equipment has been destroyed.

Nationwide Electronic Systems, Inc. (NES) has published a free brochure on getting data to and from various programmable logic controllers. It presents specific details on the use of digital meters to enhance automated manufacturing operations. The NES Applications Brochure is available by writing Jerry Bestler, NES, 3003 Wakefield Drive, Carpentersville, Ill. 60110.

Rabbit Software Corp. in Malvern, Pa., said it has signed a marketing agreement with **Gain Systems, Inc.** in Seoul, South Korea, enabling Gain to market Rabbit's complete line of DOS-based products in South Korea.

The two vendors also completed what they claimed is the first full-featured Hangeul language implementation of an IBM 3270 coaxial adapter card. Specifically, an interface was built between Rabbitstation Coax, a 3270 coaxial add-in board with software, and South Korea's Hangeul language. This product is said to be the first to supply South Korean computer makers with an alternative to IBM's proprietary 5550 personal computer approach.

Herb Hensley, 48, president and chief executive officer of **Data Race, Inc.**, was recently named 1988 Entrepreneur of the Year for high technology in South Texas by *Venture Magazine* and Arthur Young. Data Race makes high-speed, full-duplex, error-protected, dial-up modems. It claims to have pioneered dial linkup of remote asynchronous terminals with systems at speeds previously attainable only by direct, local connection.

Wollongong Group, Inc. in Palo Alto, Calif., has agreed to port the New York State Education and Research Network's network management software to a variety of platforms, including Digital Equipment Corp.'s VMS, Microsoft Corp.'s MS-DOS and Unix operating systems. The software is said to provide host configuration, problem determination and network configuration for Transmission Control Protocol/Internet Protocol networks.

Level One Communications, Inc. in Folsom, Calif., and **Mitel Corp.** in Kanata, Ont., have announced a five-year agreement to jointly develop transceivers that will support T1 and Integrated Services Digital Network transmissions over twisted-pair telephone connections. The market for such transceivers will reach $700 million by 1992, the partners claimed.

The **Lanier Voice Products Division** of **Harris Corp.** unveiled an agreement with **Harris 3M DPI** to launch the national distribution of Lanierfax, a series of private-label facsimile machines. In addition to managing distribution, Lanier will also provide all technical service and customer support for Lanierfax.

Chromatic Technologies, Inc. in Franklin, Mass., announced that several of its standard fiber-optic products, including the Chromatek Series 800 plenum cables and the Series 400 cables, are certified for Tempest applications.

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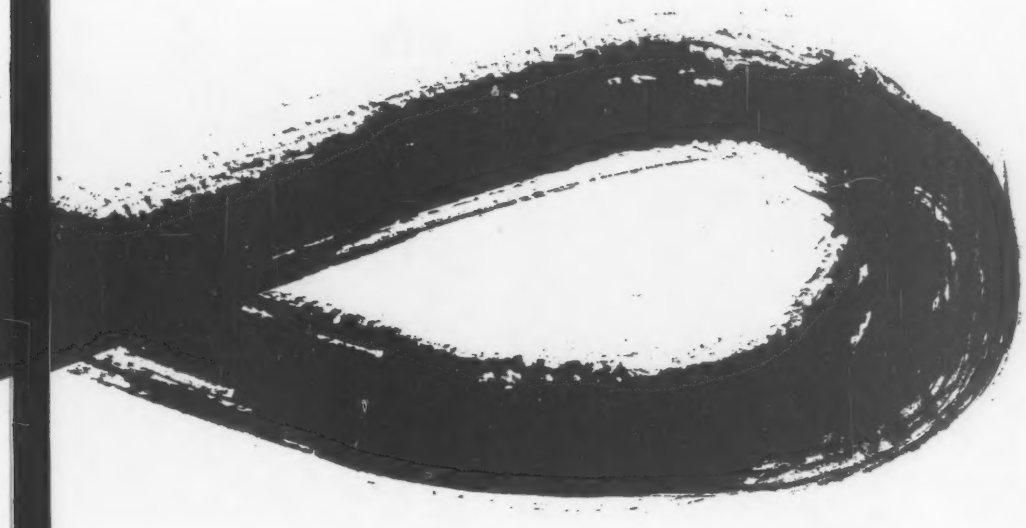

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configured with two packet-switching processors, the intelligent bus switch, two power supplies, two sets of I/O logic and one set of fantails, all contained within a single cabinet.

The C/3D and C/300D are priced starting at $54,000.

BBN Communications, 70 Fawcett St., Cambridge, Mass. 02238. 617-497-2683.

File servers

A local-area network-based distributed data base server has been introduced by **Via Information Systems Corp.** The company claims that the product, **Via/DRE**, will bring full mainframe-like capacity to business personal computer LAN users.

Features reportedly include a data base server that offers both peer-to-peer communications and a distributed relational data base environment and a C language object-oriented programming environment called **Via/Cool**. The product also includes automatic logging and SQL facilities.

Via/Cool costs from $1,395. The Via Host Data Base Server costs from $3,500.

Via Information Systems, Suite 209, 101 Carnegie Center, Princeton, N.J. 08540. 609-243-0433.

Xyplex, Inc. has enlarged its communications server lineup with the addition of an eight-port terminal server card that supports RS-423C connections.

The **RS-423 Terminal Server Card** was designed to plug into Xyplex's Maxserver 5000, a high-density communications server that offers both Digital Equipment Corp. VAX/VMS and Transmission Control Protocol/Internet Protocol (TCP/IP) support.

The Terminal Server Card also reportedly supports speeds of up to 38.4K bit/sec. at 500 ft and 19.2K bit/sec. at 1,000 ft. The product is compatible with most RS-232 connections. However, the vendor offers an RS-232 card for devices such as certain private branch exchange switches that may not be RS-423-compatible.

The RS-423 Terminal Server Card Model MS-Asynch J8 costs $1,395.

Xyplex also announced it is offering a **Thin-Wire Ethernet Cluster Controller.** The product is said to provide eight asynchronous connections to DEC's VAX/VMS processors or to other hosts running TCP/IP. Users can then access terminals, workstations and other devices on a Xyplex network over a local or remote Xyplex server.

The controller is downline-loaded by application-transparent software that resides in the VAX/VMS system. The product operates with either host interface software running over an existing VAX Ethernet controller card or over an optional enhanced-performance plug-in card for the VAX.

The Thin-Wire Ethernet Cluster Controller costs $2,575.

Xyplex, 100 Domino Drive, Concord, Mass. 01742. 617-371-1400.

If You Develop Software Applications On IBM,

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NEW PRODUCTS

Links

Software that reportedly allows personal computer users to access and process information from asynchronous host mainframes and minicomputers is available from **Westford Harbor Co.**

Called **Reunion Connectivity**, the product provides a platform for bidirectional communications between host computers and PC applications. A multitasking kernel is included to enable the software to run behind other applications programs.

Emulation of Digital Equipment Corp. VT220, VT100, VT52 and IBM 3101 terminals is provided through a serial port and a network adapter, and the package supports industry-standard protocols available on the host computer.

Reunion Connectivity costs from $175 for a PC license.

Westford Harbor, 288 Littleton Road, Westford, Mass. 01886. 617-692-9440.

Crystal Point, Inc. has enhanced its asynchronous telecommunications and emulation package, **PC-Term 3.2.**

Six additional terminal emulations have been added: Data General Corp. 410, Honeywell, Inc. VIP 7801, Alpha Microsystems AM62, Cifer T205, Esprit Systems, Inc. III and NCR Corp. 7901. All are provided at no extra cost to existing PC-Term 3.2 users, who can download them from Crystal Point's on-line update system.

Package capabilities also include macro programming, multiple sessions and remote access. The software supports multiple text file transfer modes and is said to be capable of emulating a total of 23 different terminals.

PC-Term 3.2 costs $649 for up to eight workstations and $1,600 for up to 32 workstations.

Crystal Point, Suite 202, 12707 120th Ave. NE, Kirkland, Wash. 98034. 206-821-1909.

Protocol converters

An intelligent data switch and protocol converter designed to interface with Ethernet and Starlan local-area networks has been announced by **Quasitronics, Inc.**

Called the **Q-8100**, the product reportedly can expand an existing network by providing eight individually addressable asynchronous RS-232 ports and two Ethernet or Starlan ports. Integration requires carrier-sense multiple access with collision detection and 1M byte of memory on board.

The Q-8100 carries a price tag of $2,195.

Quasitronics, 211 Vandale Drive, Houston, Pa. 15342. 800-245-4192.

BBN Communications Corp. has announced two dual-processor packet-switching nodes, the **C/3D** and the **C/300D.** According to the vendor, both products act as end-point CCITT X.25 switches and concentrators and include a proprietary intelligent bus switch to ensure continuous communications.

Features include automatic switchover without operator intervention and power-on servicing. Decentralized network management functions such as multiple addressing options and call accounting are also included. The products are

Or Both,

asynchronous terminal.

PAD functions include the ability to time division multiplex either one or two channels and a broadcast mode for heavy outbound traffic applications.

The four-port X.25 PAD is priced at $1,710, and the eight-port version costs $2,570.

Codex has also introduced the **Codex 2234**, a dial modem with Microcom Networking Protocol and speed conversion. The product can be used for both asynchronous and synchronous applications and operates at 300, 1,200 and 2,400 bit/sec. over a single dial line, according to the company.

In asynchronous applications, the modem is IBM Personal Computer AT command software compatible. In synchronous applications, the Codex 2234 Terse Auto Call Unit mode is V.25 bis compatible for autodialing. A front panel allows modem configuration, operation and testing.

The Codex 2234 costs $595.

Codex, Maresfield Farm, 7 Blue Hill River Road, Canton, Mass. 02021. 617-364-2000.

A series of fiber-optic modems and multiplexers for the IBM 5250 environment is now available from **Opcom, Inc.**

The **Twinaxers** series was designed for IBM System/36 and 38 computers that incorporate 5250 communication protocols, and the products reportedly can maintain links up to 15,000 ft.

Th **OC405X** multiplexers are available in four- and eight-channel units with varying combinations of twin-axial and fiber connections. The multiplexers are priced from $2,295. The **OC3250** fiber-optic modems were designed to connect System/36 and 38 terminals to a local controller. The OC3250 costs $525. Both product lines are equipped with test-mode switches.

Opcom, 345 Industrial Blvd., McKinney, Texas 75069. 214-542-3358.

Two internal modems designed for IBM and Compaq Computer Corp. microcomputers are now available from **Hayes Microcomputer Products, Inc.**

The **Smartmodem 2400P** for the IBM Personal System/2 Models 50, 60 and 80 can be installed in any Micro Channel expansion slot. The unit reportedly supports up to eight communication ports and offers a 16-byte first-in first-out data buffer to prevent data loss.

The **Smartmodem 2400Q** was designed for the Compaq Portable III and Compaq 386 machines.

Both the Smartmodem 2400P and 2400Q feature automatic speed adjustment, international compatibility and call progress monitoring. The Hayes standard AT command set is used to configure the modems from the terminal keyboard, thereby eliminating the need for DIP switches.

The modems are priced between $549 and $649, depending on configuration and communication software ordered.

Hayes Microcomputer Products, P.O. Box 105203, Atlanta, Ga. 30348. 404-449-8791.

Electronic mail

PCC Systems has entered into a joint marketing agreement with **Data Voice Solutions Corp.** (DVSC)

Under the terms of the agreement, DVSC will market PCC's **CC:Mail** electronic mail software package in combination with DVSC's **Centaur II** multiuser, multiprocessor Microsoft Corp. MS-DOS-based computer system. The Centaur II series provides centralized MS-DOS computing capabilities for standard ASCII terminals.

The Centaur II/CC:Mail combination is said to be compatible with all popular makes of local-area networks, thereby allowing users to route E-mail messages between any mix of terminals, personal computers, LAN-attached PCs and remote peripherals via a modem pool.

The CC:Mail package costs from $595. Centaur II systems cost from $26,000 to $185,000, depending on configuration.

PCC Systems, 480 California Ave., Palo Alto, Calif. 94306. 415-321-0430.

Security

Infosafe Corp., formerly A-O Electronics, has introduced a security product for personal computers called **Xfile-D**. Xfile-D is a software encryption package designed for program and data protection on the IBM Personal System/2.

Developed as an add-on product to the X-Lock 50 Data Security System, the product also uses Data Encryption Standard methodology.

Xfile-D has an introductory license fee of $49.95.

Infosafe, 2137 Flintstone Drive, Tucker, Ga. 30084. 404-491-8044.

Modems/Multiplexers

Racal-Vadic has added data compression to its line of 2,400 bit/sec. full-duplex modems. The **2400VP** has been upgraded with Microcom Networking Protocol (MNP) Class 5 data compression, and the company has introduced a new model, the **2400PAC**. The 2400PAC is a high-speed, full-duplex, dial-up modem incorporating Compressor, a data compression technique from Adaptive Computer Technologies Co.

With Compressor, the 2400PAC transmits data at 7.2K bit/sec., and in the fallback mode it is compatible with MNP Class 5 data compression. The product operates in either synchronous or asynchronous mode and was designed for personal computer and terminal applications such as interoffice file transfer and electronic mail.

The 2400PAC costs $795. The 2400VP with MNP Classes 4 and 5 upgrade costs $595.

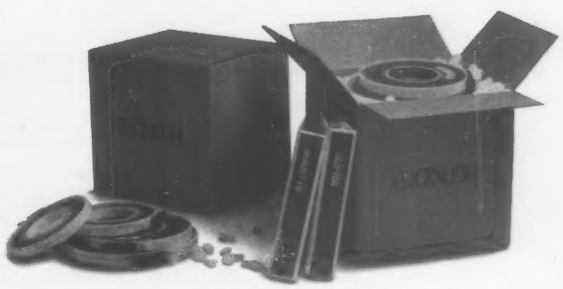
Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95305. 408-432-8008.

An integral asynchronous CCITT X.25 packet assembler/disassembler (PAD) has been introduced by **Codex Corp.** as an option for its 2600 series of point-to-point modems.

The **X.25 PAD** is said to allow network users working from a single location to run multiple programs in multiple hosts.

The product is available as either a four- or eight-port card and was designed for use in X.25 networks.

Configuration of the PAD is accomplished through the X.25 network control terminal, the Codex 6510 Netminder management system or a locally attached



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A T1 channel service unit that provides the interface between customer equipment and a T1 facility is being offered by **Datatel, Inc.**

The **DCP3552** unit includes testing capabilities, storage of historical performance data, console and front panel control and signal format conversion.

The T1 facility may be T1.5, AT&T Accunet Reserved 1.5 or other equivalent T1 services. Customer equipment may include T1 multiplexers, D4 channel banks and private branch exchanges. Transmission distance is said to be up to 6,000 ft with 19-gauge wire.

The DCP3552 costs $2,950.

Datatel, Cherry Hill Industrial Center, Pin Oak and Springdale Roads, Cherry Hill, N.J. 08003. 800-424-4451.

An automatic line switch that reportedly allows facsimile and modem-based terminals to share a single, standard telephone line has been announced by **Extel Corp.**

Called **Line One**, the product allows customers to send and receive facsimile and data communications from a modem-based personal computer or message terminal without installing a second line. Line One runs on 115 VAC, 60Hz and has a 230 VAC, 50Hz option. It is compatible with Hayes Microcomputer Products, Inc. modems and most Group II and III facsimile terminals. A standard phone line and RJ11 jack are required.

Line One costs $295.

Extel, 4065 Commercial Ave., Northbrook, Ill. 60062. 312-291-8410.

A security modem that includes Microcom Networking Protocol Class 5 error control capability has been announced by **Western Datacom.**

The **424 Line Backer** is a 2,400 bit/sec. V.22 bis and AT&T 212A-compatible device that features extensive diagnostics and speed conversion functions, the vendor said.

The product's nonvolatile memory allows for user configuration as either a two-wire dial-up modem with callback security or as a two- or four-wire leased-line modem with two-wire dial backup.

The 424 Line Backer costs $795.

Western Datacom, P.O. Box 45113, Cleveland, Ohio 44145. 800-262-3311.

Diagnostic equipment

Telenex Corp. has introduced the **Spectron Networker**, a series of network control and diagnostic products.

The products were designed for data centers with manual patching or switching equipment so that they may be upgraded to support automated monitor access, circuit status, alarming, remote monitoring and fallback switching.

The core of the Spectron Networker is an IBM Personal Computer or compatible that functions as a host controller and contains the Remote Monitor Access and Remote Switch Control system configuration data bases. It also serves as the operator interface.

The products reportedly support networks from 16 to 512 lines per node as well as single-site networks or networks with up to 64 remote nodes.

The Spectron Networker costs from $150 per line.

Telenex, P.O. Box 869, Mt. Laurel, N.J. 08054. 609-234-7900.

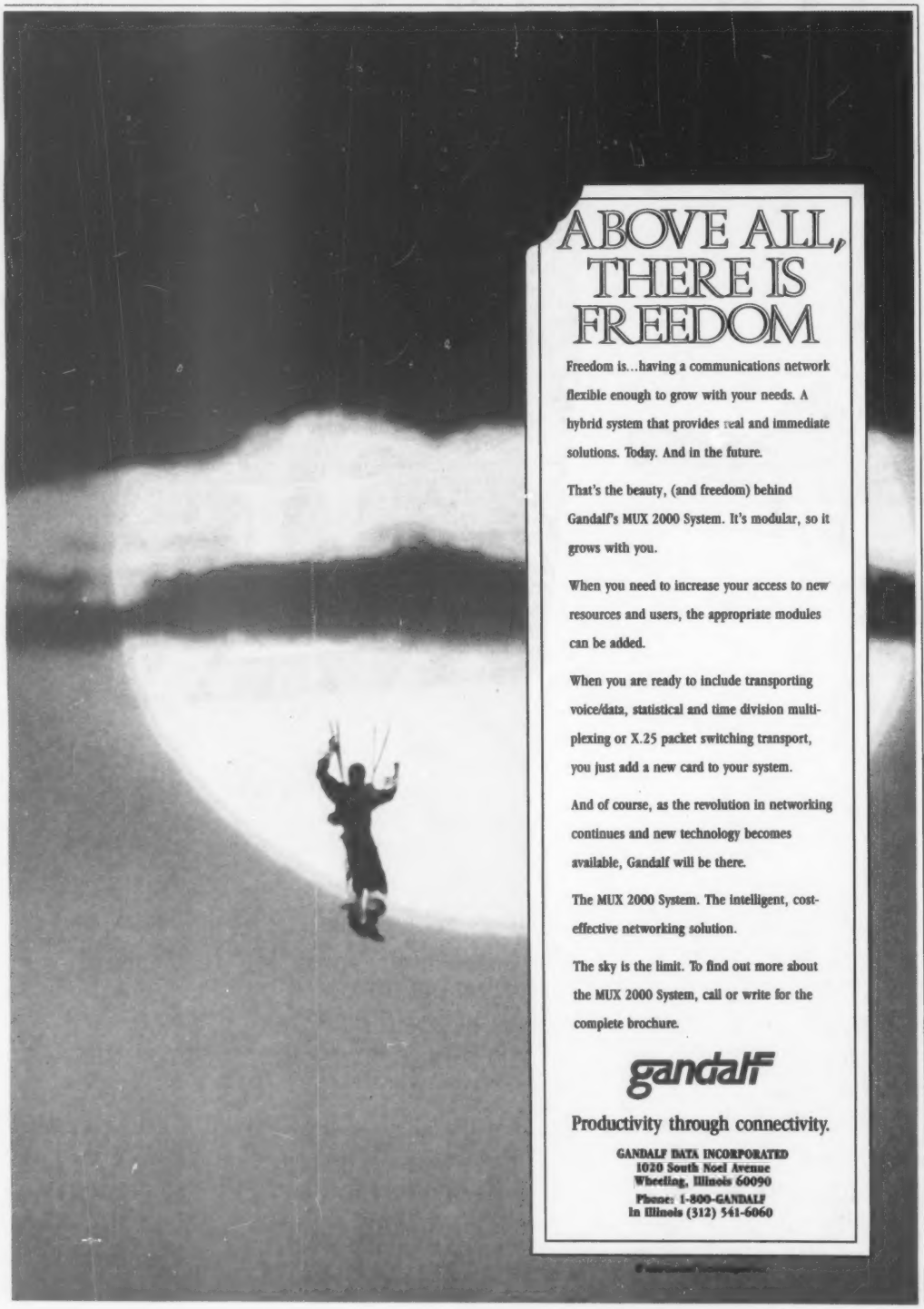
Azure Technologies, Inc. has expanded its protocol analyzer family by adding the **Twinaxscope** to its IBM Personal Computer-based product line.

The product was designed as a support tool for suppliers of twin-axial-attached products for the IBM System/34, 36, 38 and Application System/400 line of computers.

According to the vendor, Twinaxscope can provide both suppliers and users with a method for resolving twin-axial networking problems. The device incorporates a personal computer board and software for converting IBM PCs and compatible systems into twinaxial data analyzers. Features include menu interfaces and search functions.

Twinaxscope costs $3,995.

Azure Technologies, 38 Pond St., Franklin, Mass. 02038. 617-520-3800.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Living in two worlds: A programmer's lament

You're happy in your work — but nobody else wants to hear about it

BY DAN WOODS

When you love your work, it's natural to want to share your enthusiasm — and it's colossally frustrating not to be able to.

At dinner with my fiancee a couple of weeks ago, I felt wonderful. I had just completed a day of programming in which a lot of what I call "crystallization" had taken place. All the various subsections of my program snapped into a working whole.

My fiancee could tell I was happy, and I wanted to tell her why. Over hors d'oeuvres, I explained how hard I had worked on each separate part of the program. I told her how much time I had spent desk-checking — poring over the listings again and again to make sure each subroutine worked.

I explained how I methodically wrote the main section of the program that used all the subroutines. I told her how all the test data that I had very carefully designed ran through correctly in the end.

I was full of myself — I had triumphed over my own fallibility and created something consistent. But as I finished my story and looked to her for approval, I was disappointed. She wasn't even sure whether I was finished with my explanation.

The look on her face said merely, "I'm glad things went well, but I haven't a clue what you're talking about."

This is what is so difficult for a programmer. I was full of feelings of elation and I wanted to share them, but I couldn't. Eventually, my feelings turned into frustration, isolation and anger.

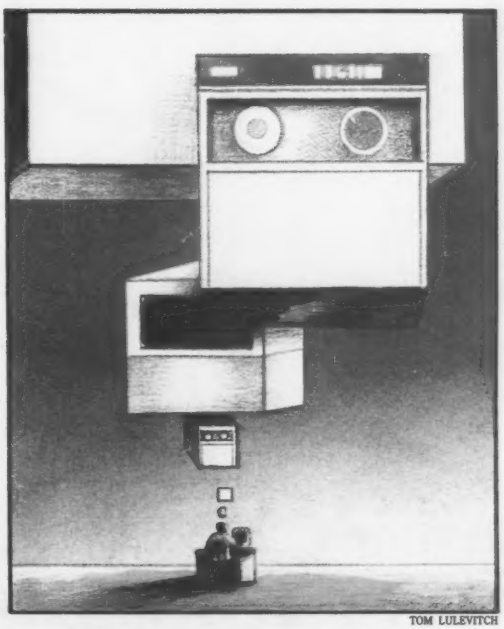
For us programmers, most work takes place in an isolated world that is not easy to share with people on the outside. Our arcane, technical world is feared by some and held in contempt by others.

Who knows what the rest of the world really thinks we do? Maybe they imagine us to be weird sorcerers chanting incantations to silicon gods. Maybe we are seen as electronic auto mechanics.

To some, I'm sure we appear as charlatans who do nothing but speak in some cryptic, acronym-crazed foreign language.

The most troubling thought is that nobody understands that the emotions of programming are the emotions of all craftsmen, from carpenters to surgeons.

Puzzlement, anticipation, elation — it's all there. Instead, we are seen by the general populace to be as sterile and lifeless as the hardware we work with — as if the pens so often imagined in our breast pockets had punctured our hearts.



TOM LULEVITCH

Becoming ambassadors

Since the world has grown more complex, we have all become specialists. We are the masters of our own little worlds. Of course, this means we have also become ambassadors to the outside world.

What most distinguishes the world of programming from other, nontechnical worlds is that the primary relationship within our world is between a human and a piece of technology. Because programmers spend so much of their time dealing with silicon rather than flesh, we may need some lessons on being ambassadors.

For example, there is a smile that one sometimes sees on the face of an ambassador from another world. It is a smile he uses to comfort someone who is seeking help. We have all seen this smile on the faces of doctors, lawyers and policemen — that fatherly smile that says, "Calm down, you are now with someone who '*knows*' and will take care of you."

Not that all ambassadors are paternally reassuring. Sometimes a person seeking help does not receive an avuncular smile but instead a contemptuous smirk that mocks their ignorance. The fact that you are seeking help is used to torture you.

Programmers are among the worst offenders in this regard. When you as an end user find yourself at the mercy of a programmer, you must often suffer a torrent of abuse and insult in

Woods writes in English and other languages. He is a programmer and consultant at Gari Software Associates in Roseland, N.J.

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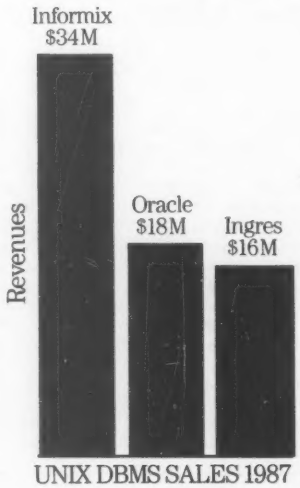

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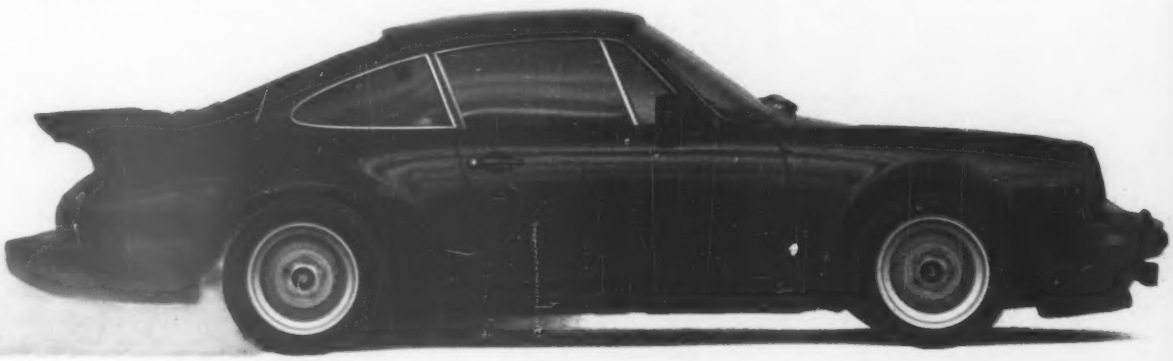

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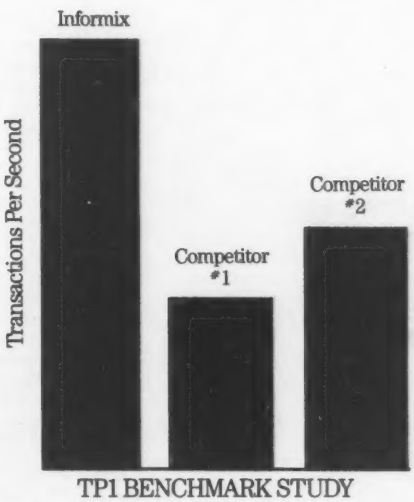

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order to have a question answered or have a problem solved.

Why do we do this? For most of us, I think it is based on the fact that a person with a question or problem represents confirmation of the fact that our work is in some sense important.

Somebody *needs* us, for heaven's sake. We exploit their need by trying to show them what we do, to force them to see the drama that exists within our lives.

How many times has this scenario played itself out in programming departments: An end user arrives somewhat anxiously with a question or problem. The programmer distractedly listens to the explanation of the problem, interrupting only to point out errors or to chuckle at the user's difficulty in speaking in technical jargon.

Finally, the programmer nods knowingly at the desperate user and starts explaining his theories about the cause of the problem, while checking them out by riffling through a variety of listings or manuals.

At first, the end user tries to be interested in these theories, but then the terminology starts swooshing past his head and ricocheting around the cubicle, creating an orbital haze of confusion.

The programmer stops explaining as soon as he has induced the hypnotic effect marked by glazed eyes and a tediously puzzled expression.

When the programmer has taken the onus of responsibility off the user's shoulders, the user relaxes and starts glancing at his watch and squirming in his chair as the programmer tries to explain the knowledge he used to solve the problem.

Eventually, the programmer realizes he is talking to a brick wall and just says, "Okay, I'll take care of it."

Instead of leaving with a warm glow, knowing that everything will be put right, the end user leaves feeling angry and humiliated.

Instead of being satisfied that he has the ability and knowledge to help someone, the programmer feels his skills are not appreciated. What should have been a helping transaction turns out to be a frustrating experience that leaves behind a bitter taste.

ALL AN end user has to do is look halfway excited about a technical detail and — regardless of the sincerity of the spark — a fire is lit within a programmer.

Malaise of isolation

How many times has an end user called a programmer after having erased every file, begging to be told what to do? And what is the typical response? Jokes, snickers, contempt — or compassion?

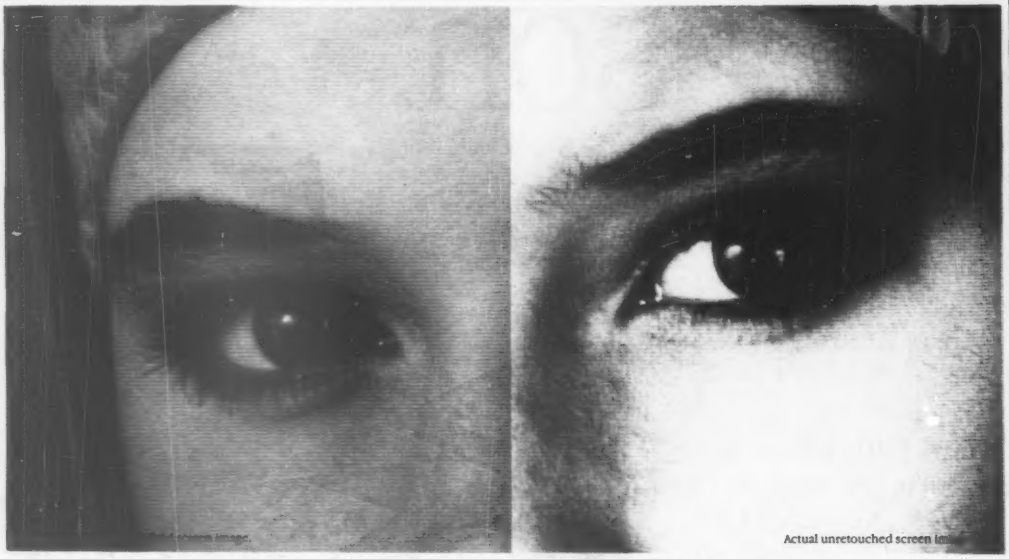
How often do programmers reassure the bereaved in such situations with the encouraging explanation that erasing all of your files is like the first time you get thrown from a horse? When is an end user educated with advice about using the save function early and often or warned about the hideous power of the wild-card character?

The malaise of isolation in which so many programmers live is also understood and manipulated outside the community of programmers. Sophisticated observers of programmers know how much can be achieved through the judicious use of a starry-eyed gaze of wonder.

All an end user has to do is look halfway excited about a technical detail and — regardless of the sincerity of the spark — a fire is lit within us. The tinderbox of unshared curiosity flares up and takes over our minds. We remember when we were wondering about the unknown instead of tediously examining the known.

Who can blame any of us for this kind of petty sadism? After all, the average programmer is generally recognized only when he has made a mistake.

Doctors receive the smiling gratitude of the healed, police of the helped, lawyers of the freed. But what do programmers



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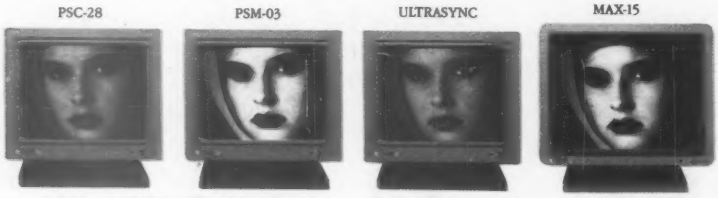

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receive? Usually a screaming phone call in the middle of the night about a program that doesn't work. How many times have you heard of a programmer being called to say nothing's going wrong?

The wonder days

Programming, like philosophy, begins in wonder. At least it did for me. Today's younger generation was reared in the 1980s, a time when computers have been as common as toasters. But I always saw computers as some kind of special, revered object. When I began my career as a programmer, I never really saw a computer — only the terminals that represented its ubiquity and power.

After my first programming class in college, I was deeply hooked. I felt algorithms could do anything. At every turn, I was programming in my mind. When I would ride on an elevator, I would start writing an algorithm to manage the elevator traffic most efficiently. At grocery store checkout counters, I would try to figure out inventory algorithms. Everything should have a next step; nothing should be left to chance.

WHEN I began my career as a programmer, I never really saw a computer — only the terminals that represented its ubiquity and power.

Then I was introduced to data structures and the world became one huge array of memory. Next, it was compilers and operating systems, and my model of the world became still more complex. No experience, no activity was beyond the reach of the computer metaphor.

Throughout this time, a transformation took place. Gradually, as my knowledge of computers grew, I wanted to share my excitement.

While I was in the beginners' classes, I could share some things with my friends. I would tell them about the game of "Life" or some other introductory programming exercise, and there would be some glimmer of understanding in their eyes.

But in the more advanced classes, my isolation became complete. The only people who could understand the grueling drama were the other students in the class. They were the ones who stumbled around the terminal room at 4 a.m. when anything anybody said seemed completely hilarious.

I remember the night before our compiler was due. A few teams of students had their programs completed and were standing around the terminal room mostly just to gloat and make comments.

Other teams were almost done, finding a few bugs here or there. Then there were the unfortunate ones who did not have enough time to finish — and knew it. They changed and compiled, changed and compiled, hoping they might get lucky and have the correct code spill out of their minds through some kind of divine intervention.

I remember how long past midnight, one of the unfortunate ones snapped. He had had enough of chasing after a particular bug and he leaped up and screamed at the top of his lungs as he ran out the door. A few people laughed as the door slammed behind him and the rest of us soberly glanced at one another as if to say, "It could have been us."

Mad scientists

In those first days of my life as a programmer, the only frustration sprang from the difficulty of learning. The fact that nobody else understood the work we were doing made it all the more glamorous.

We were the mad scientists who were living on some edge created by the challenge of programming. The isolation of our world gave us a monastic status.

But when I entered the work force, all of this pleasure in guruship was somehow left behind. The first time I entered a large corporate computer installation, I knew something had been lost.

The room was huge and

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bright with fluorescent light. Rows and rows of washing machine-type disk drives filled the center of the room. The CPUs stood lifeless in a corner. All the operators had an unconcerned air, like off-duty soldiers leaning against tanks.

The people I worked with at that first job in a big bureaucracy wanted to be anything but programmers. To be a programmer was not to be part of an elite monastic community — it was a stigma.

Of course, the work was very much the same. It was just as exciting to get something working and running well as it had ever been. But the reward of the work itself wasn't enough. In order to be somebody, other people had to know you were doing well. After about a month of working there, a manager took me aside to give me the facts of life. "Programming is fine," he explained, "but let's just look at the way the world works." He drew two boxes side by side on a sheet of paper. He labeled one "technical" and the other "management."

"The way the world works," he said, "is that if you are technical, then you are given things by management, but if you are management, you give things to yourself." He then drew arrows from the top of the management box pointing down onto the technical box and chuckled. "You don't want to be *'technical'* all your life, do you?" he asked, emphasizing the word technical like it was some fatal disease.

Programming for a living

I have one friend who works as an IBM systems programmer. When people ask him what he does for a living he just says "programming" and doesn't try to explain any further. "Not that anybody is really that interested in finding out," he adds with a disgusted look on his face.

It's always a struggle for me when someone asks me what I do for a living. I pause and think to myself, "Should I let it out? Should I really try to explain that although I only work with inert objects, the feelings generated by them run deep? Should I explain the challenge and satisfaction of conquering one's capacities for error?" Usually the answer to all these questions is no and I just sigh, "I am a programmer."

But sometimes when I'm out with another programmer, I get tired of settling for the kind of isolation that springs from the ignorance of the rest of the world. I just think to myself, "Well, if they don't get jokes about recursion, then that's not my problem." And my programmer friend and I spin technical jokes until everyone is just sick of us.

Sometimes the luddites are openly aggressive. One lawyer friend who was eating dinner with me and three other friends abruptly stopped a conversation we were having about biological computer memories.

She thought it rude of us to make her suffer through a technical — read "boring" — conversation. Later that evening, she went on and on about the legal details of a Supreme Court case, but of course, that was OK. The vagaries of the legal profession are within the realm of polite conversation. Biological memory just doesn't make it.

Then there are the people who really try hard to be interested in computers but just cannot seem to get the hang of it. They are amazed at all the wrong things. The simplest features of a word processor, like cutting and pasting text, are seen as gargantuan achievements. I feel like grabbing these people by the shoulders and saying, "I love your enthusiasm, but couldn't you be just a little more sophisticated?"

IT'S ALWAYS A STRUGGLE for me when someone asks me what I do for a living. I pause and think to myself, "Should I let it out?"

Full of life

Why do we programmers need this reinforcement from the outside world? Is our work so mundane and tedious that its rewards in themselves are not enough to satisfy us?

No, our work is far from lifeless. Logic does not preclude emotion. Contrary to the popular image of the cool and sterile scientist, the history of science is full of emotional hotheads who fly off the handle while thinking precisely.

In computer science, feelings are generated through a struggle with oneself to create a consistent and efficient algorithmic structure to solve a problem.

Anyone who has set out on a debugging mission knows the feeling: Strapping oneself in against a flawed finite automaton; hearing the sound of revving engines in the riffling pages of a manual; entering commands with a smash of your hand and then a spin in your chair until the moment is over and your gaze returns the luminescent glow of the tube.

Much of the pleasure of debugging is expressed by an exclamation that one programmer dubbed "the programmer's national anthem." There is a gasp and a groan that are spontaneously emitted when the unknown shrinks into the known. "Why is this variable zero? Who sets it? What is its initial value?" Then, bam! You've figured it out, and you don't realize until you're done exhaling that you have just given a rendition of the programmer's national anthem.

A tingle and exhilaration comes with

Three words that throw fear into the hearts of our competitors:

having found a solution. The best feeling is when you find a bug without reasoning but simply by intuition. The most trivial detail can spark a voice in your mind that points the way to the problem.

Mind over matter

The most interesting aspect of debugging is how your emotions affect you. If you get too excited, you can lose your grip on your methodology. We have all tried to fix bugs too much by intuition, making changes and seeing if they work, and then being frustrated when we can't think of another direction to pursue when a theory proves wrong.

In a mature programmer, the more emotional he feels about a bug, the more he sticks to his bug-solving methodology and proceeds very slowly.

In an immature programmer, feeling emotional about a program can lead to an unproductive cycle of change-and-hope, change-and-hope, because his goal is to do the minimum amount possible to get the program working.

Design also brings a shock of recognition that usually comes a little more gradually and in stages. When designing, one tries to spin webs of logic that cover the complete set of possible inputs and squeeze them out into different destinations.

One starts by constructing small disconnected units of webbing and then attempting to connect them all to solve the whole problem. Then the design is checked to see if it is complete.

Program designs are usually too large and complex to keep completely in your mind at one time, so crystallization of the complete solution cannot happen as quickly as fixing a bug.

But when drained from an exciting round of designing or debugging, you are hard-pressed to find someone with whom you can share the experience. These experiences are solitary ones; they are lone triumphs relived and enjoyed lying in bed late at night, staring up into the dark. Imagine hitting a home run in an empty stadium. Would the satisfaction be nearly as great?

We really don't want anything out of life that other people don't have. We simply want to feel that the fruits of our labor help people and that those labors are somehow appreciated.

But in technical work, the results are amorphous, and often no one really has full responsibility for any one project. We all work on parts of a task, and the whole is rarely recognized. If a program makes someone happy, does a programmer ever see that?

Someday nobody will think to write an article like this because technology will have a much more direct influence on everyone's lives. Society will be filled with people for whom an IPL is as normal an activity as making toast.

A programmer will be able to go into a bar and talk about that bug that he has just fixed and meet with real understanding. What a warm and comfy time that will be. But for now, we must settle for the wheezing vestiges of luddism that keep us to ourselves.

Not unique

Of course, this kind of isolation exists in every specialty. But in many specialties, there is some kind of human experience that we can all relate to and understand and that we go through in our daily lives.

WE REALLY don't want anything out of life that other people don't have. We simply want to feel that the fruits of our labor help people and are somehow appreciated.

At some time, we must all deal with policemen, lawyers and doctors, so we know what at least some aspects of their worlds are like. But the relationship of a programmer to his work is something that not everyone goes through — at least not in 1988.

Programmers have not been good at explaining the experience. The good news is that we won't have to. Everyone will inevitably be a programmer in some sense. How many millions have now learned to use a terminal at an automated teller machine? How many millions more nonprogrammers will be writing and maintaining programs in order to do their jobs?

In my opinion, all future jobs will be reducible to programming tasks. In those days, a dancer will complain to a painter about the bug in his choreography data base, and the painter will respond that he really hates those languages that declare variables implicitly.

Can you imagine a political process in which Mike Dukakis accuses George Bush's campaign of incompetence because it uses a batch mailing-label system while his campaign has a completely interactive, menu-driven, update-and-query front end? Or Reagan sending Gorbachev electronic mail? Or summit negotiations conducted via a computer videoconference?

As the world of computers and programming expands to touch more lives, the isolation of the programmer will decrease. But until that expansion occurs, programmers will simply have to be happy with the reward of the programming itself. We will have to live our lives in two parts — one half with people, the other half with our programs — until the world has merged the two as much as we have. •

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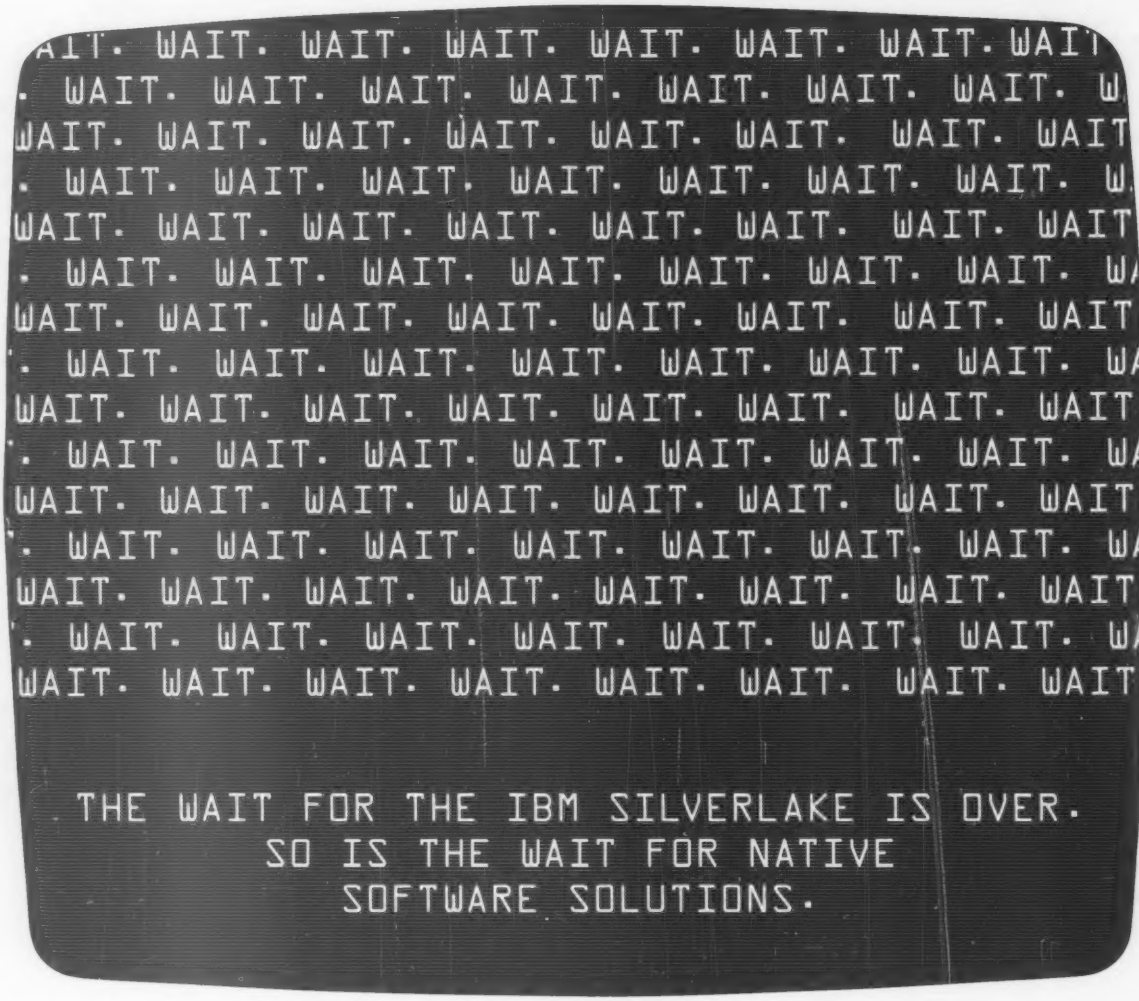

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Cool dudes need not apply

Computer execs who constantly kvetch about the lack of proper education in the nation's colleges, particularly in such disciplines as engineering and computer science, may soon have access to all the skilled personnel they need. They just won't be from the U.S.

Most college students imagine a future that's just too cool to include hard-core computer science. Money can be made faster in mergers and acquisitions on Wall Street. Italian shoes and sports cars are the trappings of success, not wingtips and pocket protectors. And while they may be able to hack with the best of them, running an MIS department is, like, totally goober.

Enter an immigration bill that could provide a new source of skilled MIS workers. Already blessed by an overwhelming vote in the Senate and awaiting approval by the House of Representatives is a bill that would dramatically increase the immigration of skilled workers to the U.S.

The definition of "skill" is up to the U.S. Department of Labor, and those immigrants could account for 55,000 people a year. Two other categories covered by the proposed law, one for those holding advanced degrees or who have "exceptional abilities in the sciences, art or business" and another for

Continued on page 78

Study: CIOs rank high in health care hierarchy

BY JAMES CONNOLLY
CW STAFF

CHICAGO — Chief information officers (CIO) in the health care field are breaking away from a reporting structure that places them under the chief financial officer (CFO), according to a recent study by Chicago-based recruitment search firm Heidrick and Struggles, Inc.

Now, CIOs are more likely to report to their organizations' chief executive officers or chief operating officers (COO).

"Historically, the typical health care CIO reported to the chief financial officer. Our study shows increasing visibility for this function and a surprising departure from the past in that only 16.7% of responding CIOs say they report to the CFO," said Lee Hilling, head of Heidrick and Struggles' Boston Health Care Practice.

The firm surveyed 218 health care organizations ranging in size from fewer than 200 beds to more than 1,000 beds.

CIOs in larger organizations tend to report to their COOs or CFOs, while those reporting to CEOs are more likely to be in smaller hospitals, according to Heidrick and Struggles. The firm found that 37.2% of CIOs report to COOs and 34.3% report to CEOs.

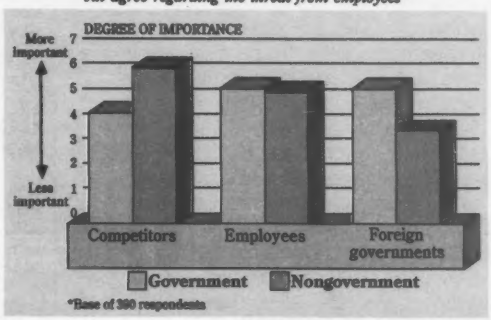
Heidrick and Struggles also looked at CIO salary structures and found that more than 80% of health care industry CIOs earn base salaries ranging from $50,000 to $89,900. Those in the $50,000 to $69,999 range tended to be in smaller hospitals, while those in larger organiza-

Continued on page 74

Data View

Top secrets

*For the top three groups from whom they wish to protect information, government and nongovernment respondents set different priorities but agree regarding the threat from employees**



*Base of 390 respondents

INFORMATION PROVIDED BY ERNST & WHINNEY
CW CHART

HBO breeds MIS star

VP Collins splices info services, business side

BY ALAN ALPER
CW STAFF

NEW YORK — To excel in an industry marked by bloody competition, entertainment companies need MIS executives who are as crafty as film directors or editors and as daring as on-camera talent.

The successful MIS executive, therefore, combines a keen understanding of the entertainment business with a deep-seated love of technology. Add a creative management style to that potent mixture and the countenance of Albert E. Collins Jr. comes into focus.

As vice-president of information services at Home Box Office, Inc. (HBO), Collins has spent six years building a well-oiled information delivery machine.

Under his tutelage, the cable television pioneer has crafted an IBM Systems Network Architecture network that enables a swarm of workers — from network programming staff to senior management — to access subscriber, product and financial information from a variety of IBM 3270 terminals, Wang Laboratories, Inc. displays, Microsoft Corp. MS-DOS-based microcomputers and Apple Computer, Inc. Macintoshes.

User interface

Yet "Albee," as Collins is known within the $1 billion Time, Inc. division, is the first to admit that advanced technology is not sufficient in itself to deliver useful information. The 57-year-old native New Yorker spends a lot of time roaming HBO's offices to ascertain user needs.

"Albee's role is to interface with the business side, find out what is going on and come up with ideas for information services and delivery mechanisms," says Doug Spitz, HBO's vice-president of systems development and planning and Collins' systems architect.

Collins runs a 90-member MIS department with an annual budget of $10 million that places as much emphasis on entertainment industry knowledge as it does on technical skills. It is a shop in which teamwork is rewarded and people work hard but do not spend every living hour on the job. It is a place where Collins gives people enough latitude to do their jobs in the most creative way possible.

"The key is to give people interesting work and let them do it," Collins says in an understat-

Continued on page 82

PROFILE
Albert E. Collins Jr.

Position: *Vice-President of Information Services Department, Home Box Office, Inc.*
Mission: *To communicate with the business side of HBO and develop information services and mechanisms to address the business needs.*

MANAGERS ON THE MOVE

Rodgers joins Transamerica Life

S. Creadick Rodgers recently joined **Transamerica Life Companies** in Los Angeles as senior vice-president and chief information systems officer.

Rodgers was previously executive vice-president of information resources and data processing at Centrust Savings Bank in Miami. In his new position, Rodgers will be responsible for information systems handling Transamerica's life sales administration, pension, consumer credit insurance and Medicare systems, office network information services, data management, corporate data processing and information systems administration.

Born in Coral Gables, Fla., Rodgers majored in management at the University of Miami.

Boston Edison Co. has named **Arthur P. Phillips** vice-president of customer and corporate information services, which includes responsibility for customer accounts, customer service, technical office services and information systems.

Phillips, 51, joined the electric utility in 1964 and was an electrical engineer in the firm's distribution division. He previously worked in Boston Edison's Information Systems and Engineering Research and Planning Departments. He is a graduate of Tufts University.

Phillips replaces David J. O'Connor, who recently retired.

Highland Superstores, Inc. in Plymouth, Mich., recently promoted **George Buick** to vice-president of information systems. Buick joined the electronics and appliance retail chain in 1987 as director of information systems. He previously worked with McCrory Stores, Zale Corp. and Citicorp. He holds an undergraduate degree from the University of Illinois and completed an executive MBA program at Northwestern University in Evanston, Ill.

Boston Edison's Phillips

Jack H. Hazen has been named manager of data processing at ***The Boston Globe***, where he will be responsible for the development of computer systems used in the newspaper's business applications. Hazen joined the Globe in 1984 as a software analyst. He previously worked for F. W. Faxon Co., Coopers & Lybrand and NCR Corp. Hazen majored in business administration at Monmouth College in Monmouth, Ill.

A new CIO wellspring?

BY JAMES CONNOLLY
CW STAFF

The corporate world's expectations for the chief information officer (CIO) of the future evoke images of a superhuman being. He or she will understand technology while thinking business and will have the pragmatism of a politician and the adventurist spirit of Sir Edmund Hillary.

There are as many expected qualities as there are theoreticians speaking about the CIO's role, and there are plenty of debates about whether the CIO will arise from the MIS ranks or from a general business field like accounting. Now, a veteran management consultant has offered an alternative source for CIO candidates.

"Tomorrow's CIO will come from the ranks of manufacturing and engineering, which is an area with a product orientation and an overview of the business," said Milt Bryce, president of M. Bryce & Associates, Inc. in Palm Harbor, Fla.

Managers trained in data processing and in areas such as accounting hold too-narrow viewpoints to succeed as CIOs, Bryce argued.

The key to being a CIO is to look at the development of a system as the development of a product, Bryce said during a recent interview.

An engineering methodology for system development involves breaking a problem down into logical parts and looking for tools that can solve it. Bryce said people trained in data processing are more likely to look at the tool first and then search for problems to solve.

"You have to determine the logical processes involved and then look at ways to do them. The methodology tells you what you are going to do, when you are going to do it and then what tools are available," Bryce said. "We think we should have someone who understands the engineering mentality but also has a strong understanding of business," he added, noting that a pure engineer lacks the business acumen that a CIO needs. Moving people from an engineering background into business administration programs, however, is one way to prepare them for a CIO job, according to Bryce.

M. Bryce & Associates' Bryce

One of Bryce's criticisms of the MIS field centers on its focus on programming and developing computer-aided software engineering (CASE) tools. "Those people will never make it. They are too steeped in programming," he said. "People think writing a program is an art form, and CASE tools come from a programming standpoint."

Bryce, whose book, *The IRM Revolution: Blueprint for the 21st Century*, is scheduled to be published this summer, charged that MIS focuses too much on how technology can be used rather than on how problems can be solved. He cited as an example some work done with IBM's DB2 data base management system.

"DB2 is a tool for managing files. It's not the last word. It's one of a number of tools for managing files, but you have to ask yourself what happens if you are managing the wrong files," he noted.

> "TOMORROW'S CIO will come from the ranks of manufacturing and engineering."
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Health care

CONTINUED FROM PAGE 73

tions reported salaries in the $70,000 to $89,999 range. The highest salaries were in the $110,000 to $119,999 area, which were reported by 11.1% of the CIOs in the largest hospitals.

Budget range

The typical budget managed by the participating CIOs was in the $1 million to $5 million bracket, which was cited by 56.4% of the respondents.

In looking at health care CIOs, Heidrick and Struggles defined the typical executive as a 43-year-old white Protestant male, married to his first spouse. He holds an advanced degree, is employed by a nonprofit organization, has been at his current institution for seven years and in his current post for four years. He earns an average salary of $71,320.

The researchers also found that the typical health care CIO manages a departmental budget of $3.8 million, believes he should report to the CEO, thinks CIOs should emphasize their strategic role rather than their managerial role, believes that within five years, CIOs will be commonplace in health care institutions and feels colleges' curricula are inadequately preparing students for careers as health care CIOs.

MANAGEMENT BRIEFS

Manufacturers pine for integration

Progress has been made, but there is still a long way to go. That seems to be the situation as far as computers in manufacturing are concerned.

A study of computerization at smaller manufacturing firms shows that 94.1% use computers, with more than one-third of those companies having used systems for more than 10 years. Plenty of the surveyed managers said they would like to have all functions integrated into a single system, but only two of the 219 respondents claimed to have all manufacturing, financial, engineering and management functions fully integrated.

Hubbard Research in Chicago conducted the survey of manufacturing businesses with annual sales ranging from $10 million to $50 million in conjunction with **Hewlett-Packard Co.**

The researchers noted that almost half of the manufacturers plan to change or upgrade their systems during the coming year, with respondents citing reasons such as running out of capacity, the need to add a computer-aided design facility and the need to integrate more functions on a machine.

The **Communications Managers Association** (CMA) recently elected 10 members to its board. CMA represents the telecommunications interests of 200 user organizations.

Those elected to the board included CMA President Anthony F. Mattera of Prodigy Services Co.; Jerald V. Marcone, first vice-president of CMA and assistant vice-president of telecommunications at Crum & Forster Corp.; CMA Second Vice-President Kurt Mohr, who has spent 26 years in the telecommunications industry with firms such as Salomon Brothers, Inc., Goldman, Sachs & Co. and Young & Rubicam, Inc.; CMA Treasurer Ronald Kopitowski, vice-president of Irving Trust Co.; and Mukesh Shah, secretary of CMA and director of communications at City Federal Savings Bank.

They also included CMA First Past President Donald M. Gaffney, vice-president of Fundamental Brokers Institutional Associates; Lee Caputi, CMA second past president and vice-president of telecommunications operations at Goldman Sachs; Gary S. Schumer, director of telecommunications at United States Trust Co.; Charles Murray, assistant director of telecommunications at Travelers Insurance Co.; and Al Bieber, director of telecommunications at Telerate Systems, Inc.

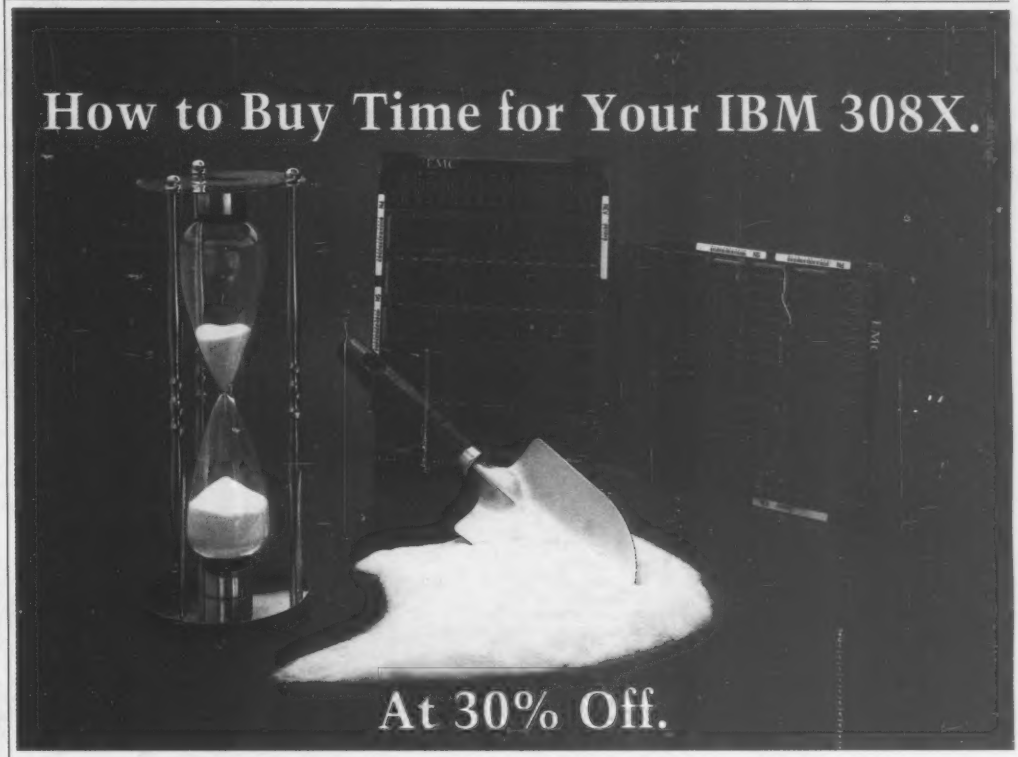
The 1-year-old **Society for Information Systems Quality** has launched its first official membership drive and a member newsletter known as "Quality Times."

The society was founded by a group of information systems professionals who said they were concerned that quality issues were not being adequately addressed. Topics in the first newsletter include logical data base design and loss control.

Information about membership is available from the Society for Information Systems Quality, P.O. Box 721, Sparta, N.J. 07871.

Everyone, be proud and happy in your job. It sounds good but may not be possible, according to a survey by **Adia Personnel Services** in Menlo Park, Calif. When presented with the statement, "Most people at my company take pride in their work," almost all of the 906 personnel decision makers surveyed (92%) voiced agreement. More than half of the managers representing the computer industry said they strongly agreed with the statement.

But were those proud employees also happy employees? Only 15% of the personnel managers said that more than 75% of their staffs were happy. The computer industry led the way, with 30% of its personnel managers saying their employees enjoy their work.



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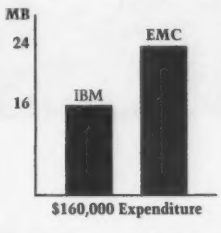

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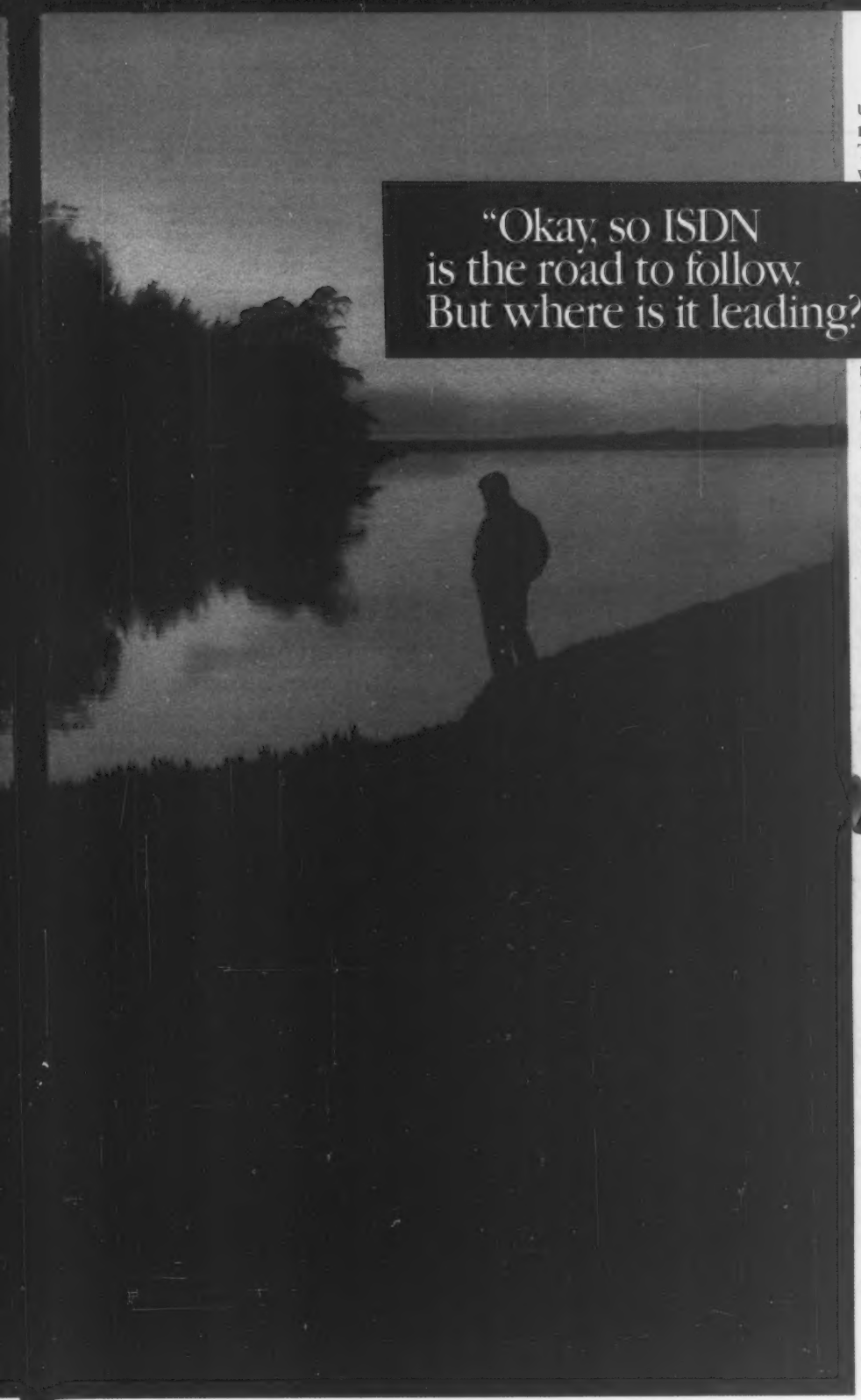

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CALENDAR

JULY 24-30

IEEE 1988 International Conference on Neural Networks. San Diego, July 24-27 — Contact: Naomi Feldman, Conference Coordinator, 3770 Tansy St., San Diego, Calif. 92121.

Navy Micro/OA '88 Conference. San Diego, July 25-28 — Contact: Code 31.4, Nardac San Diego, NAS North Island, Building 1482, San Diego, Calif. 92135.

Summer Computer Simulation Conference. Seattle, July 25-28 — Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

National Systems Programmers Association Conference. Milwaukee, July 27-28 — Contact: Naspa, P.O. Box 21525, Milwaukee, Wis. 53221.

Optical Storage Solutions: Strategic Applications in the MIS Environment. Colorado Springs, July 27-28 — Contact: The Yankee Group, Consulting Division, 200 Portland St., Boston, Mass. 02114.

EDI Intertrends Conference. San Francisco, July 28-29 — Contact: Input, 1280 Villa St., Mountain View, Calif. 94041.

JULY 31-AUG. 6

Computers in Engineering Conference. San Francisco, July 31-Aug. 3 — Contact: American Society of Mechanical Engineers, 345 E. 47th St., New York, N.Y. 10017.

Siggraph '88, The 15th Annual Conference on Computer Graphics and Interactive Techniques. Atlanta, Aug. 1-5 — Contact: Siggraph '88 Conference Management, Smith Bucklin and Associates, Inc., Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Conference On Motivating Workers. Cambridge, Mass., Aug. 2-4 — Contact: American Productivity Center, 123 N. Post Oak Lane, Houston, Texas 77024.

Uniforum/DC. Washington, D.C., Aug. 2-4 — Contact: Uniforum/DC, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

AUG. 7-13

Urban and Regional Information Systems Association Conference: Mapping the Future. Los Angeles, Aug. 7-11 — Contact: Tom Palmerlee, Executive Director, Urban and Regional Information Systems Association, 319 C St. SE, Washington, D.C. 20003.

National Association for State Information Systems Annual Meeting. Arlington Heights, Ill., Aug. 7-11 — Contact: National Association for State Information Systems, Inc., P.O. Box 11910, Lexington, Ky. 40578.

Interex, North American Hewlett-Packard Business and Technical Users Conference. Orlando, Fla., Aug. 7-12 — Contact: Interex, Conference Department, 680 Almanor Ave., Sunnyvale, Calif. 94086.

World Congress III, Computer-Assisted Valuation and Land Information Systems. Cambridge, Mass., Aug. 7-12 — Contact: Sarah J. Zabriskie, Lincoln Institute of Land Policy, 1000 Massachusetts Ave., Cambridge, Mass. 02138.

Troll Users Group Meeting. Cambridge, Mass., Aug. 8-9 — Contact: Intex Solutions, Inc., 568 Washington St., Wellesley, Mass. 02181.

Structured Development Forum X. San Francisco, Aug. 8-11 — Contact: Ted Michels, Lawrence Livermore National Laboratory, P.O. Box 808, L-308, Livermore, Calif. 94550.

Macworld Expo. Boston, Aug. 11-13 — Contact: Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

AUG. 14-20

Computer Associates International, Inc., Systems Software Conference. Nashville, Aug. 14-19 — Contact: Barbara Peacock, Computer Associates International, 711 Stewart Ave., Garden City, N.Y. 11530.

Share 71 General Meeting. New York, August 14-19 — Contact: Share, One Illinois Center, 111 E. Wacker Drive, Chicago, Ill. 60601.

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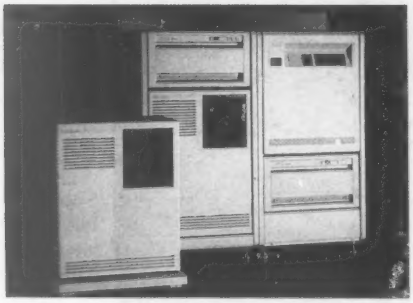

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Savage

CONTINUED FROM PAGE 73

those holding bachelor's degrees, would account for an additional 50,000 people.

The Department of Labor does not yet have a definition of what those skills would be, but Demetrios Papademetriou, director of the department's immigration policy group, says he imagines it would very much include computer sciences. Current policy ties the alien to a specific job rather than a job classification, but those visas are available to less than 10% of U.S. immigrants. Now, 90% of the visas are used for family reunification.

This bill wouldn't lessen the ability of alien families to immigrate. Instead, it will double the number of visas available.

Computer executives won't be able to simply recruit from countries they might stereotypically associate with technical expertise, like India or Japan. This is America, and we are supposed to be fair about things. Countries like Ireland and Italy, which were mentioned by Sen. Edward Kennedy (D- Mass.), one of the bill's sponsors, will have a chance to send their geniuses abroad. Each of those two countries will be allotted 7% of the "skilled" visas available.

And while attempting fairness, it's still "Americans first." The Department of Labor has the job of figuring out how to open up jobs to skilled immigrants while not adversely affecting Americans with the same educational background.

The potential for lowering the value of similar educations hovers over this kind of immigration law. If academic degrees can be bought on a world marketplace, vastly increasing the competition, those skills likely won't be worth the same dollar amount. If so, a hard-won computer science degree would be even less attractive to American students.

"We wanted people who will come and hit the ground running," says Michael Myers, counsel for the House Subcommittee on Immigration.

That may improve the picking for MIS directors — most Americans would rather hit the ground skateboarding.

Savage is a *Computerworld* West Coast correspondent.

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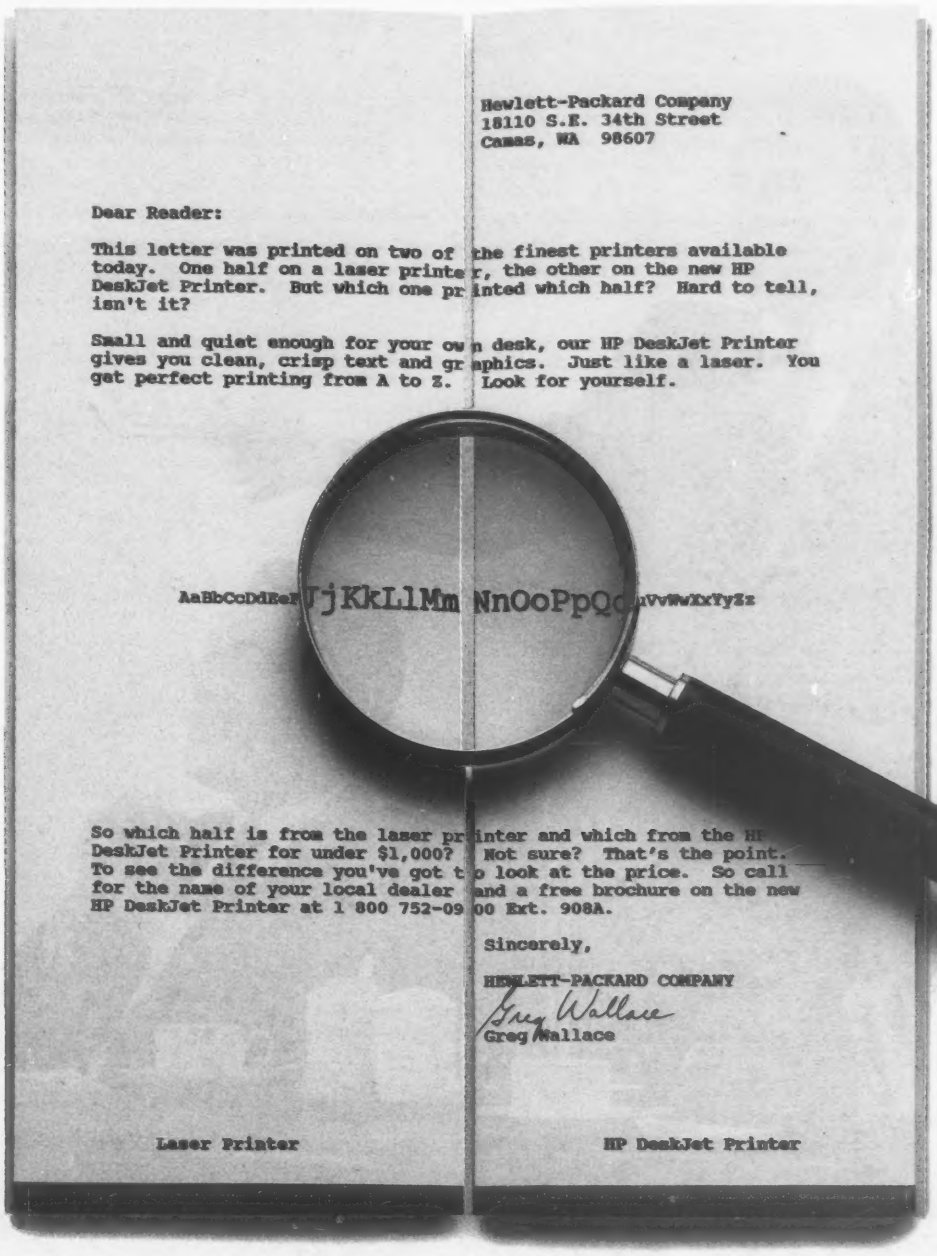
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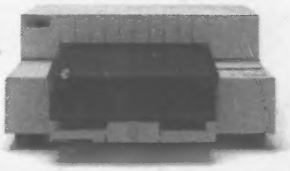

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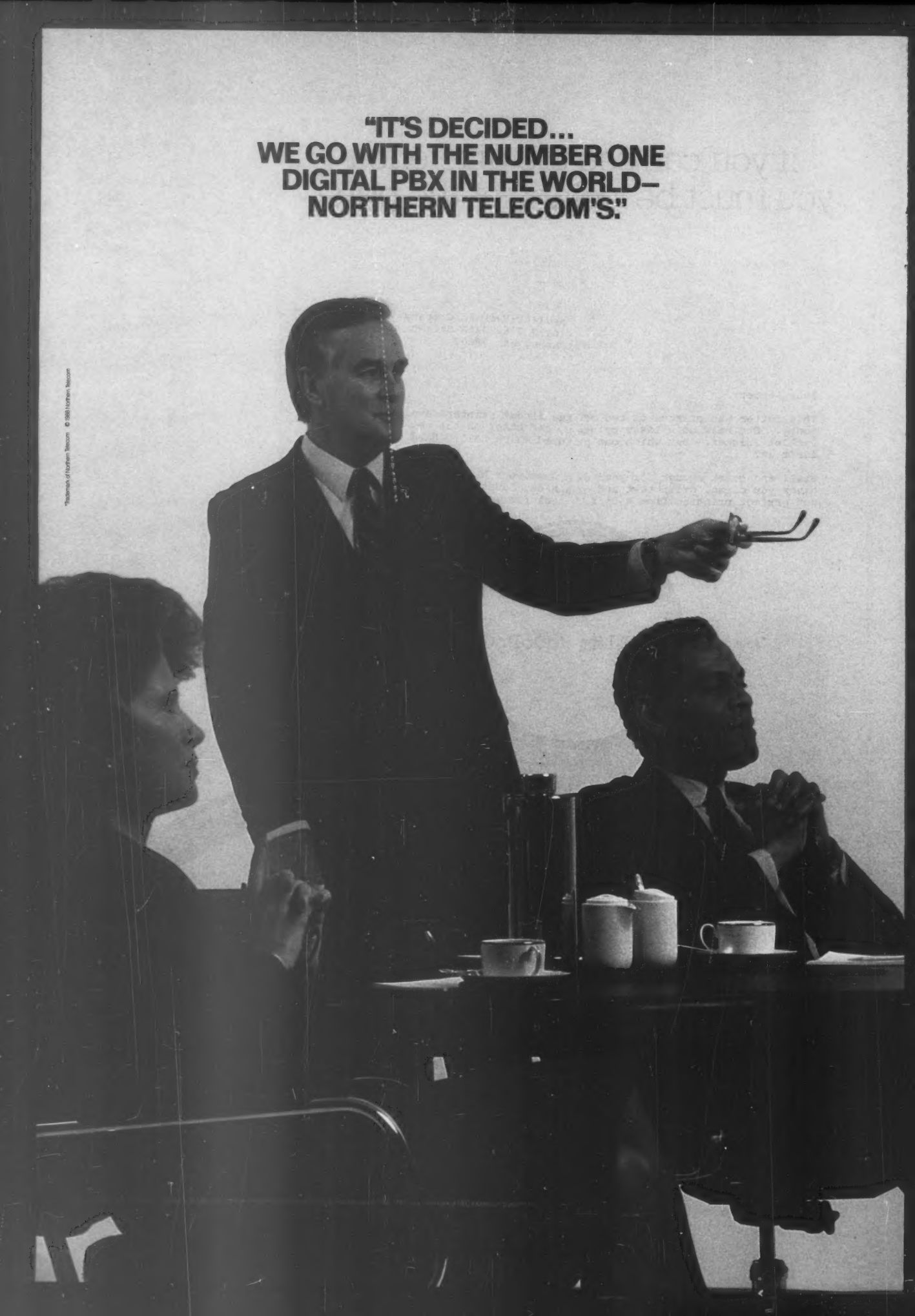

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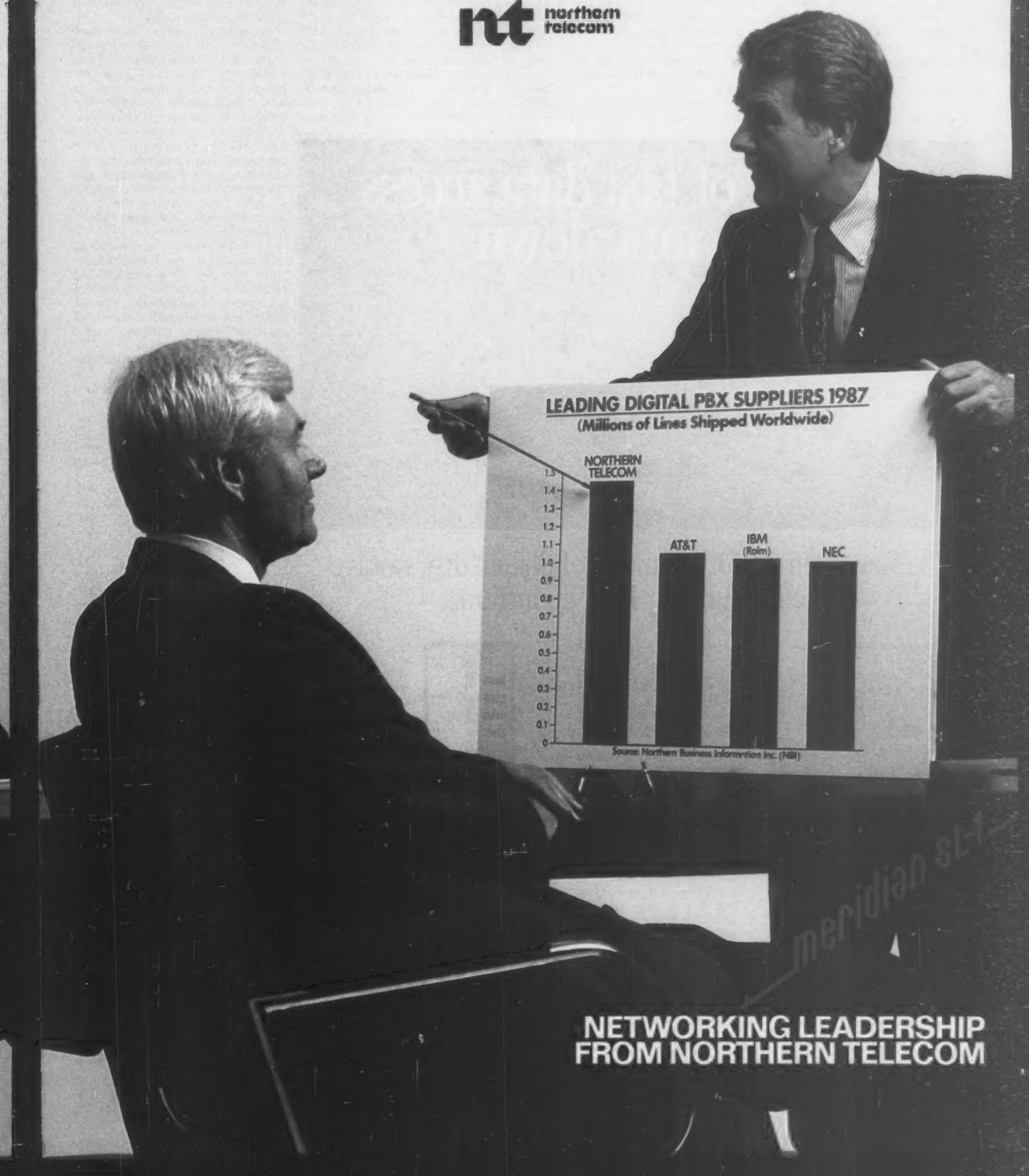

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HBO

CONTINUED FROM PAGE 73

ed fashion. "In other words, don't overmanage. Be there to assist and monitor, but don't sit over their shoulder and direct."

Collins eschews chargeback mechanisms, saying they put too much emphasis on costs and not enough on developing useful, efficient systems. Accountability with end users, he says, is gained through hard work, trust and mutual respect. Taking an empathetic position with end users engenders systems developed on time and within budget, he says.

"One of the advantages we have here is that we have a young, talented and alert work force," says Collins, sitting in his comfortable Manhattan office overlooking Bryant Park. "They're very eager and interested in using information technology solutions. They're not adverse to trying new things."

That is not how it always was at 15-year-old HBO, however. Before Collins came on board, HBO did not effectively use sales data. Moreover, the billing system that was in place did not provide up-to-date subscriber data. "They had a good start and some good people, but their efforts were not closely attuned to the business, which was growing fast. Their systems were not in kilter," he recalls.

Time's treasurer, former HBO Chief Financial Officer Kevin Senie, recruited Collins to bring order to the department and to plan for the future. "The most important thing was to hire a person with a vision," he explains. "We needed someone who understood data processing and its relation to the business."

Charting flow

Collins joined HBO from Pepsico, Inc., at which he spent 10 years working his way up through the data processing ranks before becoming corporate MIS director. He previously headed systems services at W. R. Grace & Co., spent time at AT&T as a management trainee and at IBM as a service bureau salesman.

Upon joining HBO, Collins charted the flow of information through the organization as a way of becoming intimate with the operation's intricacies. He discovered that similar data was compiled and maintained differently by various departments. Ownership of information was established to make one group or another responsible for data gathering and input. This eliminated a large number of redundant data elements.

"On the network programming side of the business, we had some 700 data elements identified, and when it came down to it, only something like 420 were actually needed," Collins recalls.

Inventory was taken of those systems already deployed. Collins then evaluated requirements for those systems under development and those that were contemplated. A three-dimensional triangle was used to track systems status from three perspectives: executive information, decision support and management control and transaction processing. Each side of the triangle represented a different functional area: network programming, sales and marketing and finance and personnel.

Collins then transformed HBO's woebegone batch billing system into a powerful sales information resource.

An on-line system — a subscriber activity manager — was developed to improve subscriber count accuracy. This system allows executives to query various aspects of subscriber data, enabling HBO to respond to trends as they develop. It also generates additional revenue through more accurate billing.

Management also decided HBO could no longer operate as an order taker. The division needed to use information technology to better market its HBO, Cinemax and Festival cable television services. Those services compete for the same entertainment dollar as other movie-oriented cable television operations and with videocassette rentals.

A system was developed to allow HBO's 10 regional sales offices to create aggressive marketing campaigns targeted at specific markets and time frames.

It's not all fun and games

However, broad entertainment industry insight does not guarantee successful systems development, Collins acknowledges. A project finance system to determine the costs of putting on specific programs had to be reworked three times before it was successfully implemented. Initial failures resulted from a variety factors, Collins says, pointing to the technical complexities of the system and a basic misunderstanding of the art of "movie deals" that led to usability problems.

Working within the freewheeling entertainment industry has allowed Collins and his staff to experiment. For example, a services management system is under development to enable program acquisition, scheduling and finance personnel to share data in an Oracle Corp. data base management system from Macintoshes running Hypercard.

Managing information technology projects will play a supportive role in HBO's effort to offer more original programming and increase its customer base. For example, a system was recently developed to switch on service for private satellite dish owners within 30 seconds of their placing an order through regional cable companies.

"You need to be careful with technology. You can fight it for a little bit and you may win the battle, but you won't win the war. The secret is how you amend, change, modify and optimize so you don't lose your position," Collins concludes.

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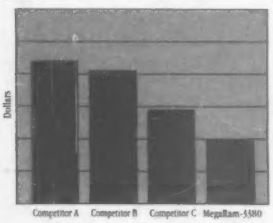

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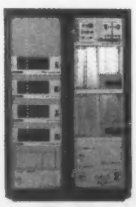

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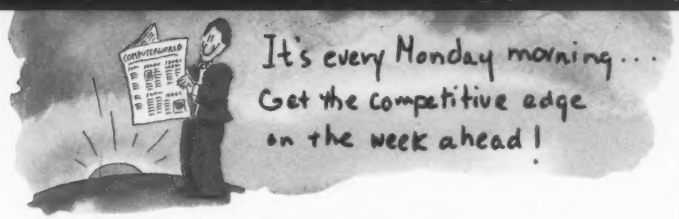

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   50. Business Service (except DP)
   60. Government — State/Federal/Local
   65. Communications Systems/Public Utilities/ Transportation
   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
   75. User: Other _____
   95. Vendor: Other _____
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   23. Dir., Mgr., Suprv., Analyst, of Systems
   31. Dir., Mgr., Suprv., of Programming
   32. Programmer, Methods Analyst
   35. Dir., Mgr., Suprv., OA/WP
   36. Data Comm. Network/Systems Mgt.
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgr.
   12. Vice President/Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales/Mktg. Mgt.
   OTHER PROFESSIONALS
   60. Consulting Mgt.
   70. Medical, Legal, Accounting Mgt.
   80. Educators, Journalists, Librarians, Students
   90. Others _____
   (Please specify)
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   A. Mainframes/Supermins
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   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

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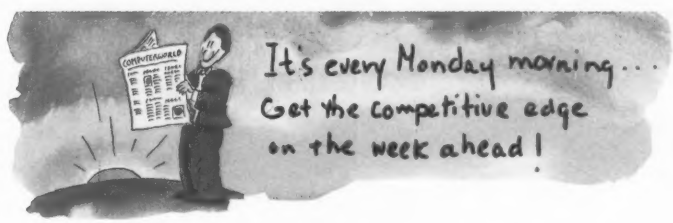

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   70. Mining/Construction/Petroleum/Refining/Agric.
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
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   21. Dir., Mgr., Suprv., IS/MIS/DP Services
   22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
   23. Dir., Mgr., Suprv., Analyst, of Systems
   31. Dir., Mgr., Suprv., of Programming
   32. Programmer, Methods Analyst
   35. Dir., Mgr., Suprv., OA/WP
   36. Data Comm. Network/Systems Mgt.
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgr.
   12. Vice President/Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales/Mktg. Mgt.
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   90. Others _____
   (Please specify)
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   A. Mainframes/Supermins
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   C. Microcomputers/Desktops
   D. Communications Systems
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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

CA bid boils software stew

Software companies and their stock prices could be in for some roller coaster riding in the next few months, courtesy of Charles Wang and his Garden City, N.Y., acquisition express.

Computer Associates went home empty-handed last week after withdrawing its $191 million offer for Management Science America (MSA), but the company might as well have quoted Gen. Douglas MacArthur when it did so. The two-week scenario that unfolded clearly indicates that Computer Associates will return — perhaps not to Atlanta, but elsewhere in the software industry.

Wang's software colossus has made no secret of its desire to hit the $1 billion revenue mark, to do so by acquisition and to expand its nonsystems software business lines. If the MSA offer is any portent, Computer Associates' desires are about to test the wills of software company executives and shareholders as never before.

That test will be this: What price will a company pay, in terms of sacrificing its potential market value, to remain independent?

Much to the relief of MSA's management, MSA shareholder-

Continued on page 90

Computer Associates withdraws MSA offer

BY JAMES DALY
and CLINTON WILDER
CW STAFF

Computer Associates International, Inc. last week rescinded its $191 million offer for Management Science America, Inc. (MSA) one day after MSA shareholders tacitly supported MSA's rejection of the bid.

Computer Associates left the door open for MSA to renew negotiations, but the Garden City, N.Y.-based software giant said it would not "unilaterally pursue" the acquisition.

The potential merger is dead "unless MSA management changes its mind," said Charles Taylor Jr., a software industry analyst at Prudential-Bache Securities, Inc. "And that's not likely at prices anywhere near what Computer Associates would want to pay."

The withdrawal of the offer was hailed by some MSA customers, who feared the effects of an unsolicited takeover of the Atlanta-based applications developer.

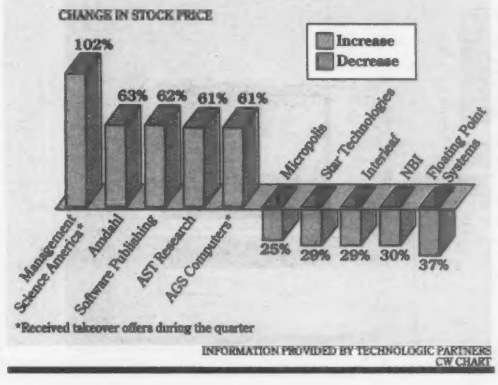
"I didn't want to see a hostile takeover," said Gary Biddle, vice-president of information services at American Standard, Inc. in New York. "MSA is a good company that had a couple of bad quarters but looks like it's

Continued on page 92

Data View

Takeover stocks surge

Top five and bottom five technology stock performers, second-quarter 1988



*Received takeover offers during the quarter

INFORMATION PROVIDED BY TECHNOLOGIC PARTNERS
CW CHART

Intel pops profit cork, toasts 386

BY CLINTON WILDER
CW STAFF

SANTA CLARA, Calif. — Intel Corp. celebrated its 20th birthday last week by announcing one of its best quarters in history on the strength of its flagship 80386 microprocessor.

Intel, founded in July 1968, reported second-quarter revenue of $727 million, 66% higher than one year earlier. Profits surged 181% from year-earlier levels and 14% from the first quarter to $131 million, or 73 cents per share.

"They blew the doors off the barn," said Andrew Kessler, a semiconductor analyst at Paine Webber, Inc. "What we're seeing is the power of a legal monopoly. They are the sole source of the standard 386 architecture that sits on the desk top."

Other firms reporting solid earnings and sales growth for the quarter ended June 30 in-

Continued on page 86

Inside

- Symantec prevails, not guilty in "look-and-feel" suit. Page 84.
- Commerce Department envoys trying to ease U.S. firms' access to Japanese market. Page 92.

IBM's patent defense

Firm airs views on RISC licensing controversy

Just as reduced instruction set computing (RISC) is warming up and not long after IBM unveiled its patent policies regarding the Personal System/2, IBM began notifying competitors with RISC systems that they may be infringing on IBM patents and may be liable for royalties.

Other RISC makers and many analysts retorted that RISC is a concept, and concepts cannot be patented. They have also argued that many current RISC systems are based on research done at Stanford University and the University of California at Berkeley, and therefore IBM patents are not a consideration.

Michael Starks, IBM's Armonk, N.Y.-based spokesman on licensing and patent issues, recently spoke with *Computerworld* senior West Coast correspondent James A. Martin on IBM's threat to enforce RISC patents.

Why is IBM starting to ask for royalties from companies that make RISC computers?

IBM invented RISC technology. Today, we hold over one dozen RISC patents. We have been approaching companies whose product lines include RISC products, and we've been doing that in order to call their attention to our patents in the RISC area.

IBM's patents are generally available for licensing under reasonable terms and conditions, and that includes RISC patents. We are actively seeking to li-

Continued on page 84

Alliant raises warning flag for first loss

Weak domestic market colors minisuper maker's quarter red

BY JAMES DALY
CW STAFF

LITTLETON, Mass. — Alliant Computer Systems Corp. has manned its damage control stations, warning that it expects to report its first-ever quarterly loss later this month as a result of domestic sales that are well below expectations.

"We've experienced weakness in the federal sector due to a slowdown in Department of Defense buying as well as a general sluggishness in the commercial sector," said Ronald H. Gruner, president of the minusupercomputer maker.

Gruner indicated, however, that some of the edge may be taken off the second quarter's poor domestic performance by international sales that have remained robust. "Firms in Japan and Europe seem much more willing to buy into new high technologies," he said, "so we've been aggressively pushing our foreign market."

Crossing borders

The 6-year-old company began a strong international push recently when it inked an agreement with Apollo Computer, Inc. that allows Apollo to market Alliant's products in specified overseas countries.

Some said this move may need to be stepped up even further as the crowded field of domestic minisupercomputer vendors slowly chokes itself.

"There are just too many players and not enough room," said John B. Jones Jr., an analyst with Montgomery Securities in San Francisco. "I think this situation is temporary for Alliant, but I expect there to be a shakeout in the half-dozen or so players who are in this segment of the market."

Ronald H. Gruner

Others warned that Alliant may need some fundamental changes in the market it chooses to approach if it wants to remain competitive with its leading competitor, Convex Computer Corp.

"Alliant's new products are geared toward the low end of the market, while Convex covers the high end," said Peter M. Musser, a research analyst at Seattle-based Cable Howse & Ragen. "At least in the computer business, I can't think of one company that's been successful at purposely keeping their selling price low."

In addition to the operating loss for the second quarter ended June 30, Alliant said it will book a nonrecurring charge for the acquisition and restructuring related to last month's purchase of Raster Technologies, Inc.

In the second quarter of 1987, by contrast, Alliant garnered income before extraordinary credits of $1.6 million, or 11 cents per share, on revenue of $13.3 million.

Patent

FROM PAGE 83

cense and enforce our patents in general. What we are discussing with other companies is not royalties but a company's possible need to license from IBM if that company wants to use one of IBM's patents. The type of license granted or needed by the licensee depends on several factors, and discussions may or may not lead to royalty payments.

Why is IBM contacting these companies now, at this particular time, just as the RISC market is starting to heat up?

We weren't granted our first RISC patent until February 1986. You wouldn't go looking for other companies using your patents until they had been granted. Before the patent has been issued, you don't have anything you can enforce.

On April 8, when we made our announcement regarding patent licenses, we took great pains to emphasize that those practices apply to IBM's entire portfolio of more than 9,000 patents. Because PS/2 was in the news at the time and a lot of attention was being paid to companies building PS/2 compatibles, that announcement was interpreted as being just related to PS/2. The fact is, the press announcement was for our entire portfolio of patents.

So the only thing really different is that our patent licensing royalty rates are higher today than they were before April 8, and the rates now are 1% to 5%, where before, the maximum was 1%.

What reaction have you received thus far from your competitors in the RISC market?

There's really not much reaction to describe so far. Normally the way this works is, IBM will identify a company whose products may use IBM's patents without a license. In that case, IBM would call the company's attention to our patents. We're very early in that process right now.

Who is IBM contacting?

I can't disclose who we're talking to.

Continued on page 86

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IN BRIEF

Symantec looks OK

A judge has ruled in favor of **Symantec Corp.** in a "look and feel" suit that was filed against the Cupertino, Calif.-based organization by **Telemarketing Resources.** That firm is also known as **Brown Bag Software.** The judge ruled that Symantec can continue to market and sell Grandview, the company's personal information management product.

Chips are up

The U.S. semiconductor market continues to head for the stars, having recently logged its 19th consecutive month of growth. Shipments to the U.S. market last month were 19% higher than those in May; June orders were 4% higher than those of a month earlier.

By any other name

San Jose, Calif.-based **Counterpoint Computers** has changed its name to **Acer Counterpoint, Inc.** The change reflects last November's merger with **Acer, Inc.**, a Taiwanese publishing and services company.

But not forgotten

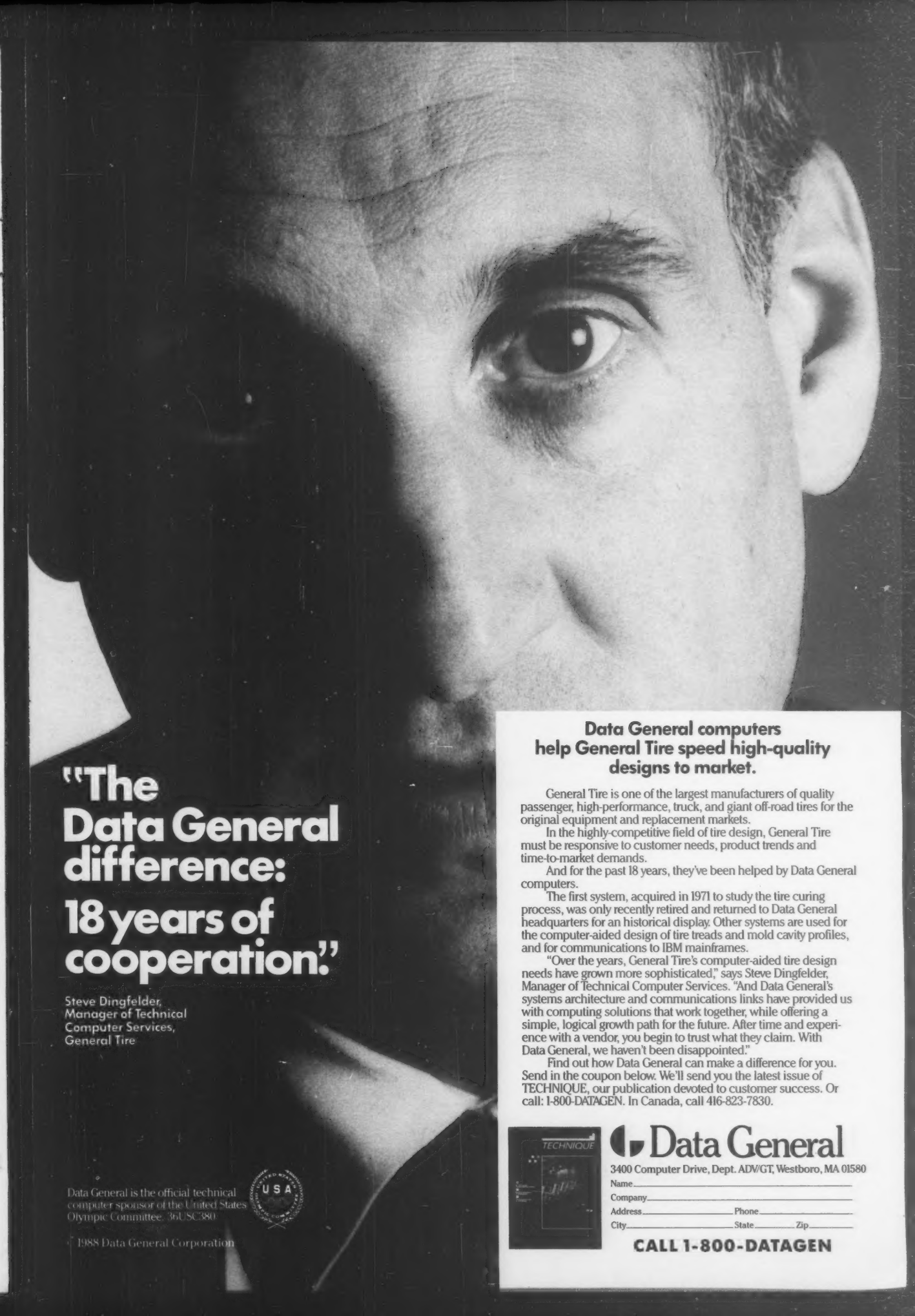
Micron Technology, Inc. President and Chief Operating Officer Juan A. Benitez has called it quits at the Boise, Idaho, semiconductor maker and has been replaced by Executive Vice-President Randal W. Chance. The firm also appointed Leslie A. Gill to its chief financial officer position.

Reaping honors

Isotec Communications, Inc. President and Chief Executive Officer Alan Kessman and **Software 2000, Inc.** President and CEO Robert Pemberton each recently snagged one of *Venture* magazine's "Entrepreneur of the Year" awards. Kessman was named "Outstanding Manufacturer in High-Technology," while Pemberton grabbed his laurels in the "Emerging Entrepreneur in Software" division.

Tech swap

Concurrent Computer Corp. has signed an agreement under which it will acquire technology to integrate **Relational Technology, Inc.'s** relational data base management system, Ingres, into a future product line. Concurrent, a Tinton Falls, N.J.-based on-line transaction processing system maker, will pay Relational an undisclosed amount for the technology and royalties for the use of Ingres.



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Intel

CONTINUED FROM PAGE 83

cluded Advanced Micro Devices, Inc. (AMD), Oracle Corp., Digital Communications Associates, Inc. (DCA) and Phoenix Technologies Ltd.

Intel decided last year to be the exclusive manufacturer of the 80386 [CW, July 27, 1987], unlike its 80286 predecessor, for which Intel licensed manufacturing rights to AMD, Fujitsu Ltd. and others.

"The strength of the personal computer and workstation markets continues to drive our growth," Andrew S. Grove, Intel's president and chief executive officer, said in a prepared statement.

Kessler noted that because of the lack of 386 competition, Intel has maintained stable pricing while its manufacturing costs, as is typical for an established semiconductor line, have dropped by about 30%. He estimated that Intel manufactures each chip for $50 and sells it for more than $200.

Intel's strong growth "is no longer just the turnaround from the [semiconductor] recession," Kessler said. "Those gains are over. They have people lining up at the door to buy their products."

AMD. The second-quarter news was not quite so spectacular at AMD, but the Sunnyvale, Calif., chip maker still reported solid profitability on a 23% rise in sales. AMD reported earnings of $26.1 million, or 29 cents per share, on revenue of $308.1 million.

Kessler said AMD's profits came not from strong growth but from stemming the red ink in its erasable programmable read-only memory chip business, which returned to the break-even point during the quarter after three years of losses.

But AMD's industry-leading percentage of research and development spending during the past three years will begin to pay off in the second half of the year, Kessler predicted.

"They didn't flush all that money down the toilet," he said. "They'll have a lot of new products out and their margins will expand."

Oracle. The high-flying Belmont, Calif., data base management software vendor reported its first $100 million quarter and more than doubled its sales and earnings in both the fourth quarter and the fiscal year ended May 31.

As it did one year earlier, Oracle racked up more than 37% of its annual sales in the fourth quarter to reach $104.2 million in revenue, compared with $50.4 million in the year-earlier period. Profits kept pace at $19.1 million, or 29 cents per share, up from $7.6 million, or 12 cents per share, in the fourth quarter of fiscal 1987.

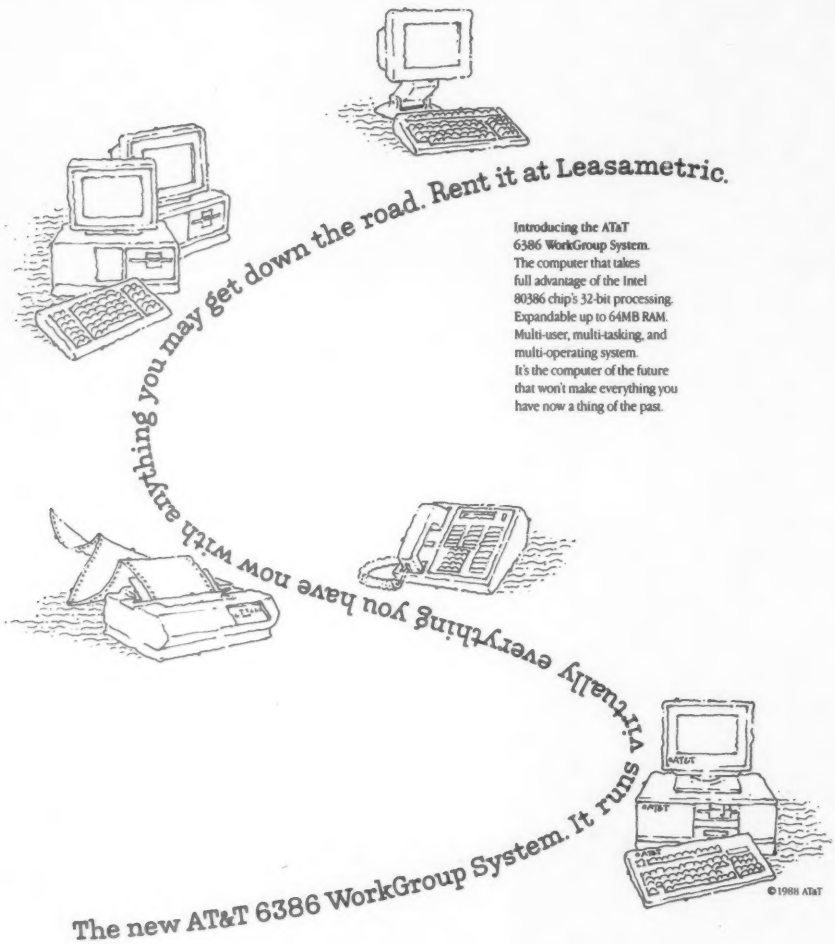
Annual revenue was $282.1 million, up from $131.3 million in fiscal 1987. Earnings for the year were $42.9 million, or 65 cents per share, compared with $15.6 million, or 25 cents per share, a year earlier.

DCA. A lower tax rate spurred the Alpharetta, Ga.-based data communications supplier to a 48% jump in profits on a more modest 25% rise in revenue for its fiscal year ended June 30. DCA earned $42.2 million, or $2.77 per share, on sales of $227.5 million.

DCA noted that its effective tax rate dropped from 39% in fiscal 1987 to 27%. In addition, it netted $1.9 million, or 12 cents per share, from the sale of its stake in Ungermann-Bass, Inc. after Ungermann-Bass rebuffed DCA's takeover attempt in favor of a buy-out by Tandem Computers, Inc.

In the fourth quarter, DCA posted a quarterly record $63.3 million in revenue, 40% above year-earlier results. Profits grew 63% to $11.3 million, or 72 cents per share.

Phoenix Technologies. In its first quarter as a public company, the Norwood, Mass.-based developer of IBM and other compatibility software earned $2.1 million, or 24 cents per share, on sales of $12 million. In the year-earlier period, Phoenix earned $1.2 million, or 15 cents per share, on revenue of $5.6 million.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Patent

CONTINUED FROM PAGE 84

What exactly was IBM's role in inventing RISC? Many people say that although IBM did get involved in RISC research early on, a great deal of development was done independently at Stanford University and the University of California at Berkeley.

In IBM's case, John Cocke, an IBM fellow, in October 1987 received an award from the Association for Computing Machinery. This award is their highest honor for technical contributions to computing. Cocke was cited by them for his significant contributions to three areas of computer science, one of which was the development of RISC computers. RISC was invented by Cocke and a small group of collaborators in the mid-1970s in IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.

Some say IBM is going after its competition in the RISC market because it is becoming a hot area, and IBM wants to put the squeeze on its competitors.

It all gets back to the question of whether or not a patent is being used, and if it is, is that company licensed? We're not targeting a particular type of technology or area of the industry or geographic region or segment of our patent portfolio. We are trying to apply our patent licenses consistently and equitably.

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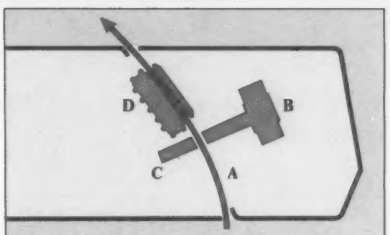

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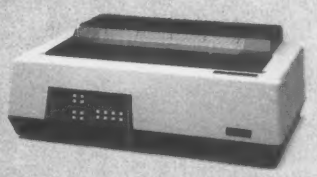

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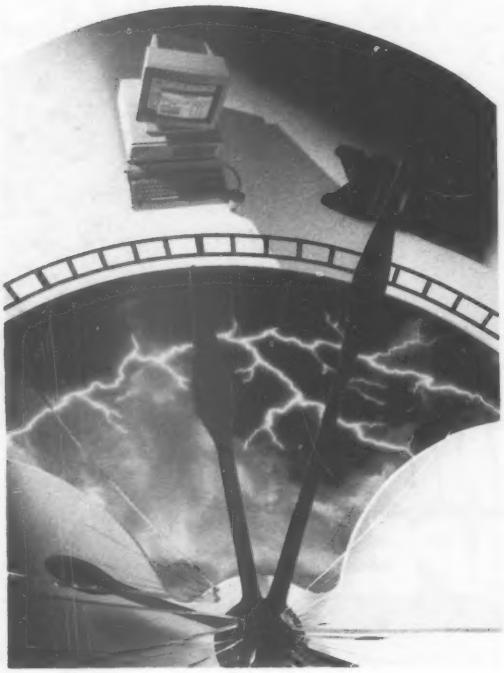

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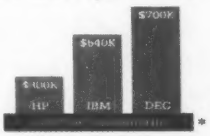

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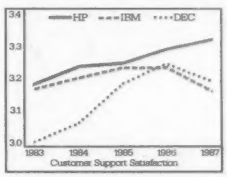

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Shaheen takes Andersen slot

CHICAGO — Arthur Andersen & Co. has appointed a new chief of its $600 million MIS consulting business in the U.S.

George T. Shaheen, former leader of Andersen's southeast regional consulting unit in Atlanta, was named managing partner of the management information consulting practice in the U.S. A 21-year Andersen veteran, Shaheen has also presided over the firm's MIS consulting in Northern California and the Carolinas.

Shaheen, 43, replaces Gresham Brebach. Brebach was reassigned by senior management in May because of suspicion that he planned to start his own MIS consulting firm to compete with Andersen in violation of the Big Eight auditing firm's by-laws [CW, May 30].

Brebach's new duties have not been determined yet, a spokesman said last week. But many Big Eight followers have said they expect him to leave the firm.

In a related appointment, Stanley L. Cornelison was named managing partner of Andersen's worldwide management information consultancy. He succeeds Simon Moughamian Jr., who will voluntarily assume other responsibilities Aug. 31. Under Moughamian's direction for the past five years, the worldwide practice grew to annual revenue of $838 million, with 13,000 consultants in 49 countries.

Wilder

CONTINUED FROM PAGE 83

ers paid dearly. MSA shares, battered by the company's painful 1987 losses and management shake-up, were hovering around $7 when Computer Associates offered an $11.50-per-share bid. Wall Street, as is its wont, went wild, pushing the stock past $13 in expectation that either Computer Associates or someone else would raise the ante.

But last Wednesday, Computer Associates yanked its offer off the table, and MSA's stock price dive-bombed so fast it looked like Gordon Gekko himself was dumping his shares. Between the early-afternoon announcement and the closing bell, MSA dropped from a high of 12 points to 9⅛.

You think the MSA stockholders who silently accepted the rejection of the $11.50-per-share offer at the previous day's annual meeting had a regret or two?

In public statements, Computer Associates executives say they would shy away from a hostile takeover, but that is a matter of semantics. Computer Associates clearly did not shy from an unsolicited offer for MSA, and the guess here is that the pursuit would still be on if MSA shareholders expressed any interest at all in the acquisition to MSA management or if MSA management and directors controlled less than the 24% of stock holdings than they do.

Computer Associates would argue that its acquisition of Uccel was a friendly deal, and it certainly was to Uccel Chief Executive Officer Greg Liemandt, majority owner Walter Haefner and major shareholders. As in Burroughs' acquisition of Sperry, however, most of Uccel's now-departed top-level managers would tell you otherwise. And many of them got very sweet severance packages, too.

THE TEST will be this: What price will a company pay, in terms of sacrificing its potential market value, to remain independent?

What is the lesson to be learned from the MSA bid? That the brothers Wang and Computer Associates are hungry again — hungry enough to test the waters of a proposed business combination by registered mail rather than at the negotiating table. MSA is not the only software vendor out there sporting a depressed stock price. "Any underperforming software company is now ripe to be approached by Computer Associates," says Charles Federman of software industry deal-maker Broadview Associates.

And with Charles Wang currently looking out at the investor community from the cover of *Forbes* magazine, Wall Street will be watching software with unprecedented interest. Market players who missed out on the quick bucks in the recent MSA parlay won't want to be left behind when Wang's Long Island railroad roars into its next stop. And the quick-buck crowd, as executives across the nation know all too well, doesn't give a hoot about vendor independence.

The conventional wisdom says hostile takeovers don't work in software because the assets of the acquired company walk out the door. But Computer Associates is not a conventional software company, and in MSA's case, for one, a lot of those assets would be people that Computer Associates would want to lop off the payroll anyway.

The software industry and investment bankers like Alex Brown & Sons have tried for years to help Wall Street understand investing in the intangible software business. Charles Wang brought the lesson to life in the past two weeks, and the software industry may see some wild times in the next few months because of it.

Wilder is *Computerworld's* senior editor, computer industry.

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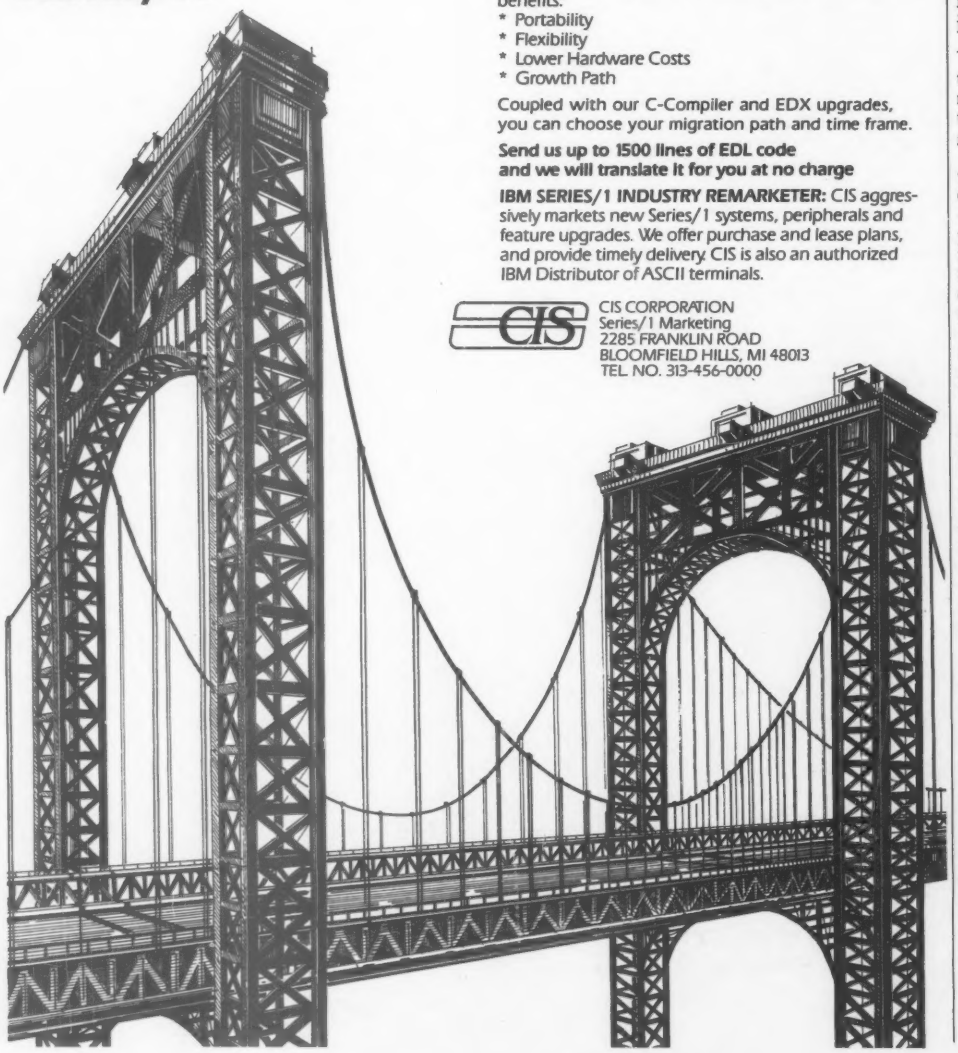

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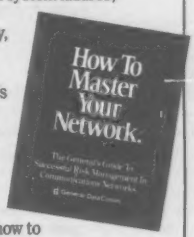

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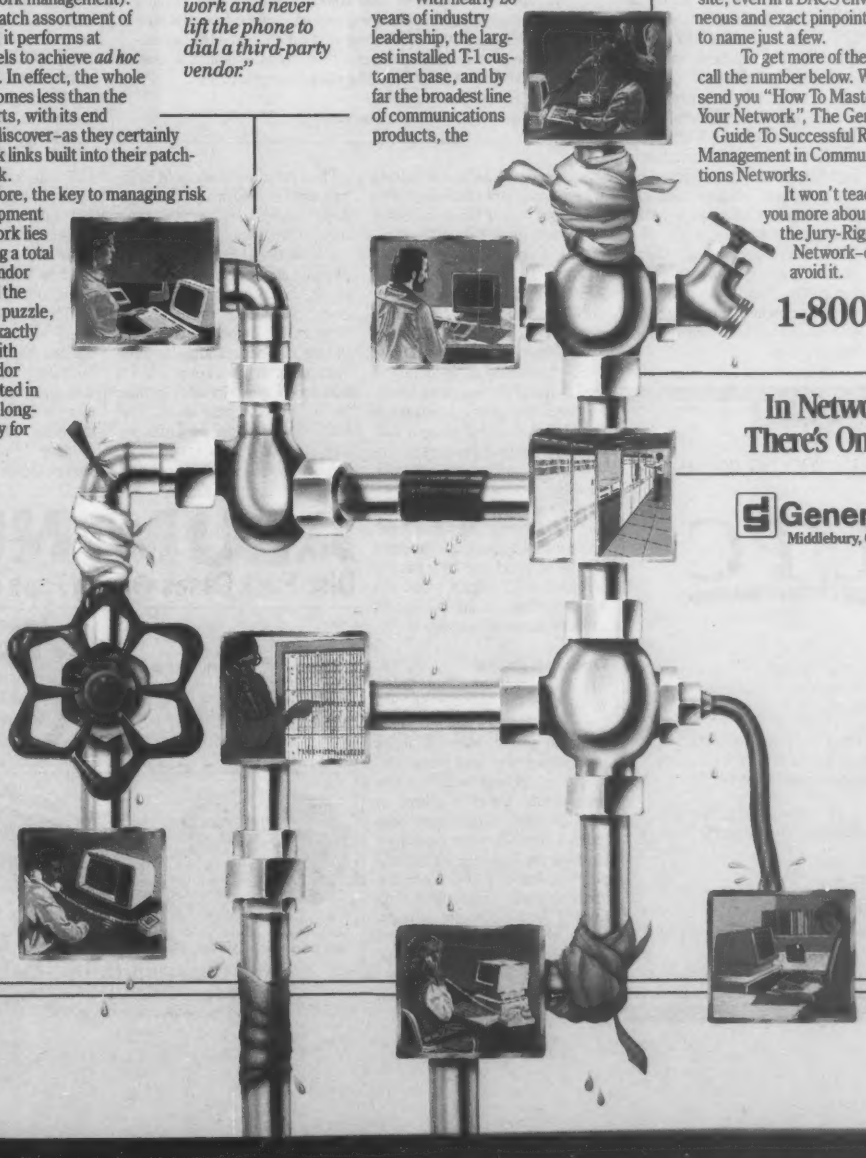

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U.S. tries to gain entry

Japan's supercomputer market tough to crack

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — A supercomputer mission led by the U.S. Department of Commerce left Japan earlier this month after its second effort within the past year to pry open the Japanese market.

U.S. trade official John McPhee led the second mission to Japan. The first visit occurred last October, just after an agreement on access to the Japanese market was concluded between the U.S. and Japanese governments. So far, no contracts have resulted in the procurement areas covered by that agreement.

> "EUROPE IS an open market where Cray still dominates. But NEC sold two or three machines there, and that's two or three accounts Cray didn't get."
>
> NORMAN J. DAWSON
> SCIENTIFIC COMPUTER SYSTEMS CORP.

Still, most members of the mission were pleased with their meetings with potential Japanese customers. The six members — Cray Research, Inc., ETA Systems, Inc., Evans & Sutherland Computer Corp., Myrias Computer Corp., Prime Computer, Inc. and Scientific Computer Systems Corp. (SCS) — held an exhibition June 28 and then met with potential customers until July 1.

"The U.S. has 80% to 85% of the supercomputer market elsewhere in the world, and more if you count minisupercomputers," said McPhee, director of the Office of Computers and Business Equipment at the Commerce Department. "But we've had a small share in the private-sector market in Japan and, until recently, no installations in the Japanese government."

On the other hand, only one Japanese company, NEC Corp., has a supercomputer installed in the U.S. Last year, MIT buckled under government pressure not to buy a NEC computer it had ordered. Instead, it purchased nothing at all.

In comparison, Cray will have about 12 systems installed in Japan by the end of this year. The firm has sold its products to almost all of Japan's auto makers.

Of the 267 supercomputers installed worldwide, about 200 are Crays, 20 or 25 are old Control Data Corp. 20Ss, about 18 or 19 are Japanese supercomputers installed in Japan, and the rest are Japanese computers in Europe and the U.S., some with European brand labels on them.

Worries linger about unfair practices by Japan against U.S. companies and about Japanese computer makers' growing presence in Europe and their technological gains.

"Europe is an open market where Cray still dominates. But NEC sold two or three machines there, and that's two or three accounts Cray didn't get," said Norman J. Dawson, vice-president of international operations at SCS in San Diego and a member of the U.S. mission.

McPhee said that although U.S. companies have held the lead in multiprocessing or parallel supercomputers, Japan holds the lead in single-processor machines. "I expect Japanese manufacturers will come out with parallel machines soon, but we have an edge now with applications software," McPhee said. "And our U.S. parallel machines will be of good use to Japanese companies." But Dawson warned that Japan will soon catch up in the software field.

Opening doors

The Commerce Department wants to make use of that time lag and is pushing Japan to open its public sector, which includes the government and some universities. Lauren Kelley, a supercomputer industry analyst at the Commerce Department, explained that if supercomputers installed by Japanese supercomputer makers for their own use are excluded, then more than 50% of the installations in Japan are in the public sector, which has been a barren market for U.S. makers.

Kelley said Cray sold its first supercomputer in Japan in 1981. "Then no more were sold in Japan until 1984, when the Japanese companies made their own," she added.

While the U.S. has been complaining about unfair practices in Japan, Japan has brought up its historic concerns about system support and timely delivery. Just before the supercomputer mission arrived in Tokyo, ETA failed to deliver a system on time to its Japanese customers. The ETA system, sold in Japan by CDC to the Tokyo Institute of Technology, is on-site now.

Criteria may change for licensing exports

BY KAREN GULLO
SPECIAL TO CW

WASHINGTON, D.C. — A proposal that would widen the criteria used to classify supercomputers for export licensing purposes is being drawn up by the U.S. Department of Commerce's Office of Technology Policy and Analysis.

According to Rajendra K. Dheer, a senior technical analyst at that office, the proposal would seek to include both vector and scalar performance in classifying computers for export licensing and would include computers with massively parallel architectures.

Existing parameters are out of date, Dheer said at a panel on export controls during a recent supercomputer conference. "The existing criteria don't cover machines without vector capability, such as massively parallel machines, and ignore the wealth of benchmark data on scalar and vector performance," he said.

Benchmarks developed by several national research laboratories and the National Aeronautics and Space Administration to measure vector performance would serve as the basis for evaluating supercomputer performance.

Currently, a machine is classified as a supercomputer if it meets one of the following criteria: peak performance of 100 million floating-point operations per second, 64-bit word size, 240M bytes of memory or vector processing capabilities.

A representative from IBM voiced concern over changing the criteria, saying that obtaining export licenses from the government is already a slow process that can take months to complete. He also called for criteria that would establish a level playing field between U.S. and Japanese manufacturers.

Gullo is a New York-based free-lance writer.

MSA offer

FROM PAGE 83

getting its act together. Having just lived through a takeover, I know what it's like to go through six months of uncertainty."

American Standard successfully fended off a takeover bid by Black & Decker Corp. earlier this year.

MSA shareholders attending the company's annual meeting did not question MSA's rejection of the Computer Associates offer and approved several anti-takeover measures that were on the agenda before the takeover bid was disclosed.

"This was a very clear indication that our shareholders value their independence," said Chairman John P. Imlay Jr. after the meeting, which packed two rooms at the company's headquarters. "This clearly demonstrates that our shareholders share a common belief in the bright future of MSA."

At the first half of its annual meeting last month, MSA revealed the takeover bid. But MSA's board added that it had rejected the bid and refused to negotiate with the suitor. The meeting was then adjourned until last Tuesday.

Although not a syllable of Computer Associates was spoken during the official 20-minute meeting, the offer was clearly on the minds of attendees, who spoke in hushed tones about the bid only minutes before the meeting began. "It's nice to see more more than three people attend an annual meeting," Imlay joked to the crowd of nearly 200.

There was also a deafening silence in the room when Imlay opened the floor up for other business. "I knew this meeting was going to be either very long or very short," said one pleased attendee as he was getting ready to leave. "I'm very relieved that we got the latter."

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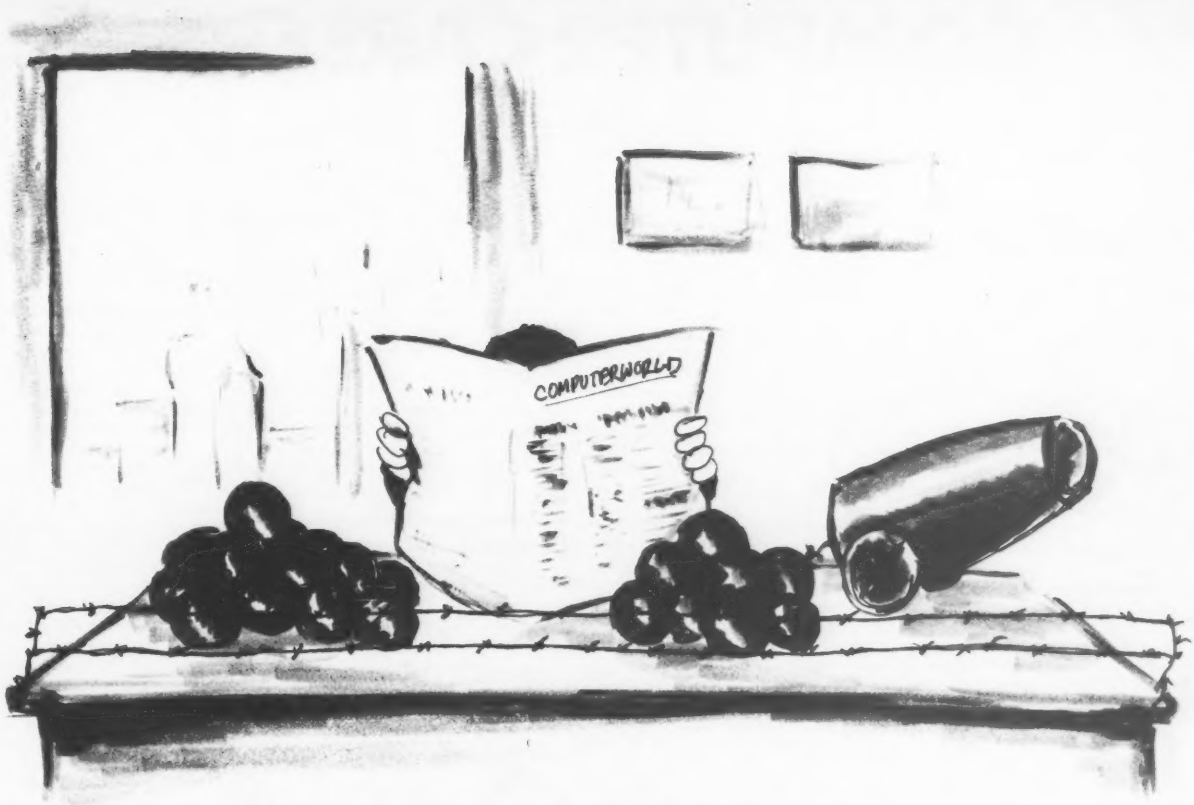

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Relocating: Look before you leap

Be careful that pricey environs don't offset the benefits of job offers

BY BONNIE MACKEIL
CW STAFF

Job candidates should be careful about letting an attractive relocation package lure them into accepting a job offer in another part of the country. If simultaneously hit with a higher cost of living, they may get less than they bargained for.

Dwight Muller, then MIS director at Storage Technology Corp. in Louisville, Colo., accepted his dream job last year as vice-president of MIS at Computervision Corp. in Bedford, Mass., and says he could not have been happier. Until he encountered the high cost of Massachusetts housing, that is.

"The company didn't prepare me for the housing market," Muller says. "I knew it was high, but I was sure I would find something." Muller is currently vice-president of corporate information resources at Prime Computer, Inc. following that company's acquisition of Computervision.

Computervision brought Muller to Massachussetts twice for job interviews and a third time, after he accepted the new position, to search for a home.

Muller suggests doing things in the reverse order. "Don't ever bring anyone into a high-income market for a house-hunting trip after they've accepted the job. Make it a condition that they come out first," he advises, "because it is absolute madness."

Cost vs. convenience

Muller is now renting a home in Londonderry, N.H., more than an hour's commute from his office, and pays two-and-a-half times the monthly payment for his former home in Colorado. Rent for a comparable home closer to work would be even more expensive.

Computervision hired a relocation service to assist Muller in finding a new home, but the service referred him to realtors who offered little or no help.

According to Muller, "realtors didn't want to deal with us because they knew we were from the Rocky Mountains . . . and wouldn't be happy with what we could afford. One realtor said she was selected to work with us because she was a junior member of the realty organization."

To add to his woes, Muller spent five months trying to sell his home in Denver because of the depressed market there.

His experience is not unique among those who move from an area with moderate housing costs to more expensive locations such as the Northeast or the West Coast, acccording to Steve Garfinkle, managing director of Richards Consultants Ltd., a recruiting firm based in Wellesley, Mass.

The situation has led to "relocation resistance" on the part of would-be hires and offers of hefty assistance packages by companies trying to attract managers, Garfinkle says.

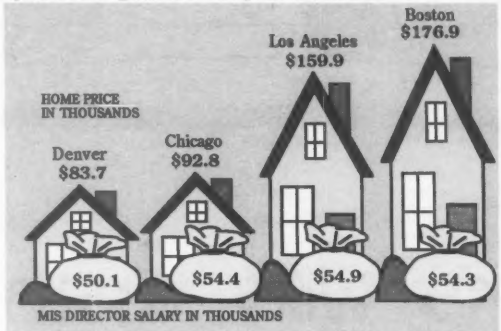
Some companies offer interest-free loans or loans that may be forgiven if the recruit stays with the company for a specified period of time. Companies also may offer sign-on bonuses of as much as $100,000 to be used for the purchase of a new home.

Relocation incentives also include the folllowing:

- Loss-on-sale programs that reimburse the recruit for a loss taken when selling his home in a depressed market.
- Financing a third-party purchase of the employee's home; the employer pays the third party a carrying charge, usually 1.5% of the purchase price, until the home can be sold.
- Mortgage-interest differential assistance that provides recruits with a salary increase for about three years to offset increased mortgage rates.

Reasons for resistance

*Variations in the salaries of MIS directors in different cities do not reflect the vast differences in home prices in those areas**



* Based on median prices for existing single-family homes in the first quarter of 1988

INFORMATION PROVIDED BY A COMPUTERWORLD/DPMA 1987 SALARY SURVEY AND THE NATIONAL ASSOCIATION OF REALTORS
CW CHART

Exceeding expectations

Just as a surge in housing costs can exceed the greater salary that comes with a new job, the reduced costs accompanying a move to a less expensive part of the country can more than offset a cut in pay.

Dale Hutchinson moved from Nashua, N.H., to Utica, N.Y. to become a microwave design engineer at General Electric Aerospace in Utica, N.Y. Although the new position required a salary cut, the cost of living in Utica is so much lower that his family is better off financially, he says. They moved from a two-bedroom house in Nashua to one in Utica with five bedrooms.

Marcia Wright, senior director of data processing at Alamo Rent-a-Car, Inc. in Ft. Lauderdale, Fla., sees resistance in recruits from high-priced areas who "see the lower salaries elsewhere and do not understand that the cost of living is so much lower."

Hutchinson points out that the improvement in his financial standing came at a price. Leaving friends and relatives strains the family. And, he notes, "It's not as though we're living in California on the beach, and people are flocking to visit. We're in upstate New York."

MacKeil is a *Computerworld* researcher.

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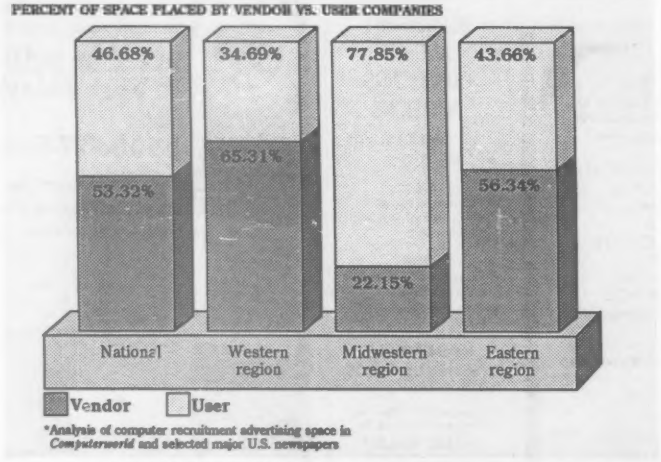
CAREER INDEX

May 1988 computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

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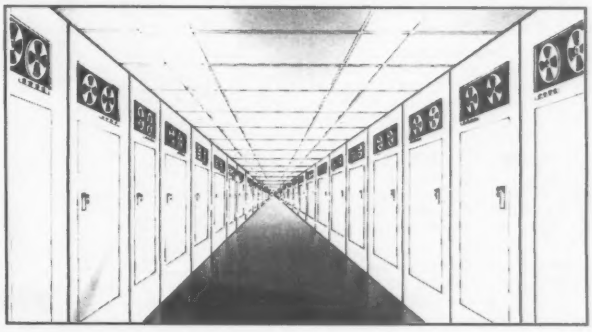

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IBM European market strong

Demand high, supply dry due to users hanging on to drives, controllers

BY ALYSON PRIOR
IDC FINANCIAL SERVICES CORP.

IBM 3380 standard drives are currently trading in Europe at the same levels seen in December 1987. Secondary market prices began firming up in February, a process that has continued to the present time.

The 3380 Model AA4 currently trades at about 22% retail, or $28,620, which is just about $11.34 per megabyte. The IBM 3380 Model B04 also climbed in value from February, remaining stable through May. In June, the Model B04 was showing a further hardening of value. Prices are currently around 32% retail, or $30,240, representing a cost per megabyte of $11.88.

This strength can be explained by the still healthy demand for 3380 standards combined with the virtual drying up of supply. The equipment is reportedly not leaving the European marketplace, and this shortage is mainly the result of users hanging on to their drives rather than moving to the new 3380 drives. At $11.34 to $11.88 per megabyte vs. $42.12 per megabyte for a 3380 Model AJ4 and $30.24 per megabyte for a Model BJ4, — and no 3990 yet — there is little incentive for users to move to the newer equipment at the current time.

The stability of the 3380 market has been paralleled in the 3880 controller market, although the gradual increase in secondary market values appears to have peaked in May. June current fair market value research indicated that the firmness in prices since the end of February is beginning to ease off a little, with June values showing minor declines.

Upgrade coming

The 3880 Model 1 market is characterized by severe shortage, particularly of the lower serial number models, as they are in very high demand. The 8170 feature can add around $1,620 to the going price. The high serial number models are mostly being upgraded to 3880 Model 3s.

IBM appears to be having some difficulty supplying the feature 3005, necessary for 3380 Model K and J attachment. Lead times for delivery of this feature vary across Europe but have been reported as high as 16 weeks in France. It is also reported that IBM is able to supply the feature but some customers are receiving only partial offers, generally of about $2,160. IDC Financial Services Corp. has reports of the 3005 commanding values much greater than this.

Generally speaking, the 3880 high serial number controllers enjoy good demand, and supply is becoming a little better. Until the 3990 begins to ship, there are very few factors expected to disturb the market, and values will likely hold quite stable through the summer months. As with the 3880 market, 3880 values are expected to begin to respond to 3990 shipments in the August to September time frame.

Drives scheduled to become available by April have remained installed. Consequently, supplies have remained short and values firm. Downside risk will reappear when the 3990 begins to ship in volume in August or September, when it is logical to expect some standards to shake loose as users install 3380 Model Js and Ks with the new controllers.

Shipment of the new 3990 and improved delivery schedules for the new 3380s could mean quite a severe adjustment beginning in the fall for the 3380 standards, but for the time being, demand continues to pressure supply. The 3380 Model AA4 price has remained static since early May, and the 3380 Model B04 continues its gradual upward creep.

While 3380 standards and 3380 Model Es have maintained an upward trend in value since early March, the 3380 Model AD4 has continued its decline, albeit gradually, since the beginning of the year. In early June, a Model AD4 was trading at around $46,980, or 42% of list (retail), with broker prices at around $37,800. Supplies are reasonable and like the standards, the Model AD4 attracts a good level of demand.

A different story

The 3380 Model BD4 is a different story. This drive has been picking up consistently since the beginning of this year. Supplies are tight, and once an available machine is located, it is quickly snapped up. June fair market values are around $48,600 retail, but this is generally perceived as a peak value and regarded as extremely high. Individual B drives are very scarce and take time to locate in the market.

Competition from the 3380 standards that offer the same capacity explains the slightly softer market for Ds, and demand for 3380 Model BD4s from users filling strings continues to exert upward pressure on values. IDC Financial Services has received reports that a number of Model AD4s and BD4s will become available in August or September, resulting in a general easing of supply.

Values on the secondary market for 3380 Model AE4s and BE4s have shown a spectacular increase since the end of February. There are virtually none available on the market and prices have increased by about 20%.

All values quoted in this article have been converted from West German deutsche marks at the July 11 exchange rate of 54 cents.

IBM disk drives and controllers

Current fair market value

	List price*	Percent of retail	Percent of wholesale
3380 Model AA4	$129,994	22	18
B04	$94,392	32	24
AD4	$111,289	42	32
BD4	$80,816	61	49
AE4	$150,390	58	47
BE4	$123,255	69	58
3880 Model 1	$58,936	23	18
3	$58,936	37	31

* IBM West German list price dollar-value equivalent

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XT Model 089	$1,350	$1,650	$1,150
AT Model 099	$1,900	$2,350	$1,800
AT Model 239	$2,550	$2,750	$2,125
AT Model 339	$3,150	$3,450	$2,900
PS/2 Model 30	$1,525	$1,650	$800
PS/2 Model 50	$2,275	$2,375	$1,900
Compaq Portable I	$750	$800	$575
Portable II	$2,275	$2,375	$1,650
Portable III	$3,000	$3,100	$2,700
Portable 286	$2,250	$2,350	$1,675
Plus	$1,025	$1,100	$900
Deskpro 20-MHz	$1,250	$1,450	$975
Deskpro 286	$2,375	$2,475	$1,800
Deskpro 386	$5,100	$5,100	$4,600
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Training

Third-party help aids learning

Taking initiative, applying leverage to vendor can boost training efforts

BY SALLY CUSACK
CW STAFF

A package of training options recently influenced a major acquisition of software by Safeway Stores, Inc., an Oakland, Calif., supermarket operator.

The buying decision was swayed by one vendor's offer to provide the initial in-house training as part of a package purchase price, according to Ferne Fedili, manager of on-line systems at Safeway. The MIS department there supports several thousand end users.

While Fedili says training should not be the basis for selecting a major software vendor, she says that it can play a part in the selection process.

This tactic is one of the means by which data processing training departments can try to extract assistance from software vendors. There are several other tacks to pursue, according to trainers and vendors.

Early talk helps

One key to getting vendors to contribute to a quality training program is establishing effective vendor-customer communications early in the buying process.

"Too often, training is an afterthought of purchase," says Sharon Tatai, training specialist at Pacific Gas and Electric Co. in San Francisco. "People suddenly realize the software will be delivered in a matter of days, and no provisions have been made for training the users."

Try teamwork

Tatai recommends trying to establish a partnership with the vendor — avoiding an "us against them" feeling between end users and vendors.

There are several basic questions that should be resolved as soon as possible, she says, including the following:

- What is the training cost per person?
- Are group rates available?
- Can the training be customized to the client's needs?
- Have the courses been tested by the vendor?
- What are the instructor's credentials?
- Will the training be done on-site?

When dealing with a vendor that will be involved with training, as with third-party trainers, Safeway's Fedili requests an outline of the course in advance and seeks to have the training customized to include terms and applications that are specific to her company's industry.

> "TOO OFTEN, training is an afterthought of purchase. People suddenly realize . . . no provisions have been made for training the users."
>
> SHARON TATAI
> PACIFIC GAS AND ELECTRIC CO.

Fern Kruger, marketing manager for customer support services at data base vendor Relational Technology, Inc. in Alameda, Calif., says that for a successful software training program, the vendor should establish a clear profile of the customer.

Kruger says this effort should involve establishing contact with the person responsible for training. The vendor representative should visit the customer site before the purchase to ascertain who is using the software and for what purpose.

Often, however, the customer may have to take responsibility for establishing this sort of rapport, particularly if the software house has only recently initiated training services for its customers.

For additional fees, vendors often offer a spectrum of training, such as classes at the customer site or at a central facility, computer-based courses, on-site consulting and a telephone hot line.

'Train the trainer'

One comparatively economical alternative to the more expensive approach of on-site classes is to just send a few representatives to an off-site seminar, Kruger says.

"These persons will then serve as trainers to the rest of the staff on-site," she says. "This 'train-the-trainer' technique works very well with small to mid-size companies."

Rick Angelini, a computer scientist with the U.S. Army's Ballistic Research Laboratory in Aberdeen, Md., agrees. The lab sent four data center employees to a three-day, off-site seminar offered by Relational, expecting them to train co-workers. "Not much follow-up has been necessary," says Angelini, although some staff members have taken more advanced training in conjunction with a users' association. Kruger also recommends extensive use of software documentation as a supplement to training programs.

Angelini has found that vendor documentation can ease the training load. "Where we used to call the company, now nine times out of 10, we just consult the manual," he says. Supplemental literature such as updates that are provided for technical reference generally address specific needs, he says.

Fedili advises user organizations to take the initiative in evaluating vendors' training. Safeway routinely asks students to critique courses they attended, usually with a written evaluation.

Cusack is *Computerworld's* new products writer.

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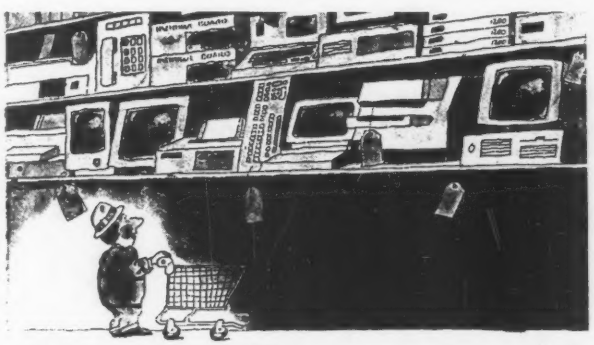

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Aug. 8	IBM Midrange Software (System 3/X)	July 22
Aug. 29	DB2 Market	Aug. 12
Sept. 19	Hardware Roundup: Large, Medium Scale and Special Purpose Systems	Sept. 2
Sept. 26	Hardware Roundup: Small Scale Systems	Sept. 9
Oct. 3	Hardware Roundup: Personal Computers and Workstations	Sept. 16
Oct. 17	AI/Expert Systems	Sept. 30
Oct. 31	Unix	Oct. 14
Nov. 14	TBA	Oct. 28
Dec. 5	LAN's	Nov. 18
Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

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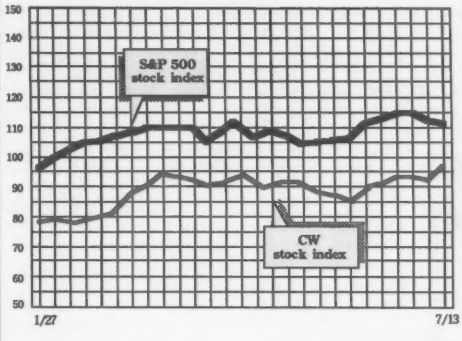

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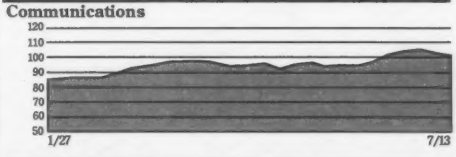
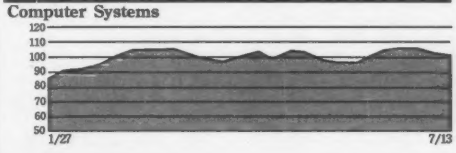
Computer Systems	104.4	**101.7**
Software & DP Services	106.1	**102.8**
Semiconductors	72.9	**71.3**
Peripherals & Subsystems	86.1	**85.6**
Leasing Companies	130.3	**118.5**
Composite Index	102.2	**91.9**
S&P 500 Index	113.9	**112.7**

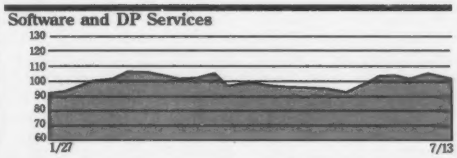
Communications



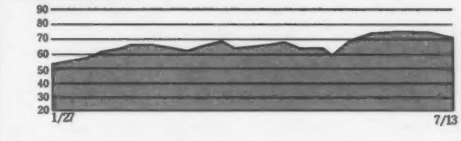
Computer Systems



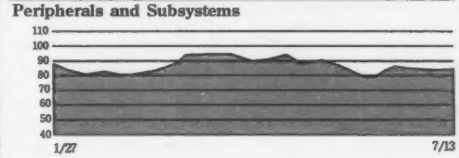
Software and DP Services



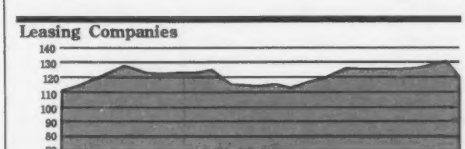
Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 13, 1988

EXCH		52-WEEK RANGE (1)		PRICE CLOSE JULY 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	100	74	89.63	-1.0	-1.1
Q	ANDREW CORP	18	11	17.50	0.5	2.9
Q	ARTEL COMM CORP	3	1	2.38	-0.4	-13.6
N	AT&T	38	20	26.13	-0.6	-2.3
Q	AVANT GARDE COMP INC	6	2	1.75	-0.1	-6.7
Q	AVANTEK INC	16	6	6.63	-0.4	-5.4
N	AYDIN CORP	35	16	19.88	-0.1	-0.6
N	BELL ATLANTIC CORP	80	61	69.75	-1.0	-1.4
N	BELLSOUTH CORP	44	29	41.63	0.0	0.0
Q	COMPRESSION LABS INC	6	2	4.00	-0.5	-11.1
Q	COMPUTER NETWORK TECH	5	1	1.28	0.0	0.0
O	CONTEL CORP	40	25	33.75	-0.8	-2.2
Q	DATA SWITCH CORP	10	4	7.88	-0.1	-1.6
Q	DIGITAL COMM ASSOC	46	20	34.38	-2.5	-6.8
Q	DYNATECH CORP	32	14	21.88	-0.6	-2.8
Q	FIBRONICS INTERNATIONAL INC	7	2	3.63	-0.1	-3.3
Q	GANDALF TECHNOLOGIES	8	5	7.13	0.0	0.0
Q	GENERAL DATACOMM INDS	10	3	3.50	0.0	0.0
N	GTE CORP	45	29	39.75	1.6	4.3
Q	INFOTRON SYS CORP	14	5	12.38	-0.4	-2.9
N	ITT CORP	66	42	52.00	-0.3	-0.5
N	M A COM INC	16	7	10.63	0.1	1.2
Q	MCI COMMUNICATIONS CORP	15	7	15.38	0.4	2.5
Q	MICOM SYS INC	17	7	14.75	-0.8	-4.8
Q	NETWORK EQUIPMENT TECH INC	28	12	20.75	-0.1	-0.6
Q	NETWORK SYS CORP	13	7	10.00	-1.0	-9.1
N	NORTHERN TELECOM LTD	24	14	18.63	-0.8	-3.9
Q	NOVELL INC	30	12	26.25	-2.0	-7.1
N	NYNEX CORP	78	58	65.25	-0.4	-0.6
N	PACIFIC TELESIS GROUP	34	23	28.88	-0.1	-0.4
N	PARADYNE CORP	9	4	5.25	-0.1	-2.3
A	PENRIL CORP	5	1	4.50	0.3	5.9
N	PLESSEY PLC	38	23	28.50	0.3	0.9
N	SCIENTIFIC ATLANTA INC	20	8	15.00	-0.3	-1.6
N	SOUTHWESTERN BELL CORP	46	22	37.75	0.1	0.3
Q	3 COM CORP	26	12	20.00	-0.3	-1.2
Q	UNGERMANN BASS INC	15	5	12.31	0.0	0.0
N	U S WEST INC	60	43	55.63	-0.9	-1.5
	Computer Systems					
Q	ALLIANT COMPUTER SYS	22	5	5.75	-0.3	-4.2
Q	ALPHA MICROSYSTEMS	7	3	6.38	-0.1	-1.0
Q	ALTOS COMPUTER SYS	15	9	9.25	-0.4	-3.9
A	AMDAHL CORP	56	19	51.13	-1.9	-3.5
Q	APOLLO COMPUTER INC	23	9	10.88	-4.4	-28.7
Q	APPLE COMPUTER INC	60	28	44.75	-1.8	-3.8
N	BOLT BERANEK & NEWMAN	25	12	17.50	0.8	4.5
Q	BRITTON LEE INC	4	1	2.69	0.2	7.5
N	COMPAQ COMPUTER CORP	79	34	62.50	-1.6	-2.5
Q	COMPUTER AUTOMATION INC	16	6	5.88	-1.1	-16.1
A	COMPUTER CONSOLES INC	9	2	8.38	-0.4	-4.3
Q	CONCURRENT COMP CORP	24	11	17.25	0.3	1.5
N	CONTROL DATA CORP DEL	38	18	25.38	-1.6	-6.0
Q	CONVERGENT TECH	9	3	3.69	0.6	20.4
Q	CONVEX COMPUTER CORP	17	6	8.25	0.1	1.5
N	DATA GENERAL CORP	119	47	84.13	-0.5	-0.6
Q	DAISY SYS CORP	12	5	9.88	-0.6	-6.0
N	DATA GEN CORP	37	16	22.88	-0.6	-2.7
N	DATAPOINT CORP	9	3	5.00	0.0	0.0
N	DIGITAL EQUIP CORP	200	99	108.50	-6.4	-5.5
N	FLOATING POINT SYS INC	12	3	3.00	0.1	4.3
N	GOULD INC	34	8	15.63	-0.1	-0.8
N	HARRIS CORP	41	22	29.00	0.0	0.0
N	HEWLETT PACKARD CO	74	36	53.00	-0.9	-1.6
N	HONEYWELL INC	91	49	68.63	-0.6	-0.9
N	IBM	176	102	125.25	-1.6	-1.3
Q	INFORMATION INTL INC	16	9	15.00	0.0	0.0
Q	IPL SYS INC	3	1	2.13	-0.1	-5.6
Q	MASS COMPUTER CORP	14	4	3.63	-0.1	-3.3
N	MATSUSHITA ELEC INDL LTD	228	103	188.38	-4.6	-2.4
Q	MEGADATA CORP	6	2	2.81	0.1	2.3
Q	MENTOR GRAPHICS CORP	39	14	33.25	-2.5	-7.0
N	NBI INC	14	4	4.13	-0.1	-2.9
N	NCR CORP	87	50	62.13	-1.1	-1.8
N	PRIME COMPUTER INC	31	12	15.13	-0.8	-4.7
Q	PYRAMID TECHNOLOGY	16	5	14.50	-0.8	-4.9
Q	STRATUS COMPUTER	35	15	26.00	-2.3	-8.0
Q	SUN MICROSYSTEM INC	44	14	37.25	-2.5	-6.3
Q	SYMBOLICS INC	5	1	1.19	-0.1	-5.0
Q	SEQUENT COMPUTER SYS INC	20	9	18.38	0.6	3.5
N	TANDEM COMPUTERS INC	37	16	19.25	-1.0	-4.9
N	TANDY CORP	57	28	44.38	-0.5	-1.1
N	ULTIMATE CORP	37	12	12.63	-0.6	-4.7
N	UNISYS CORP	48	24	34.63	-1.6	-4.5
A	WANG LABS INC	19	10	10.25	-0.4	-3.5
	Software & DP Services					
Q	ADVANCED COMP TECH	6	1	1.13	-0.2	-16.3
N	AGS COMPUTERS INC	30	11	27.13	0.4	1.4
Q	AMERICAN MGMT SYS INC	20	9	16.88	0.1	0.7
Q	AMERICAN SOFTWARE INC	19	6	13.50	-0.4	-2.7
N	ANACOMP INC	12	4	9.50	-1.4	-12.6
Q	ANALYSTS INTL CORP	10	4	8.13	0.1	1.6
Q	ASHTON TATE	33	13	24.25	-0.5	-2.0
Q	ASK COMPUTER SYS INC	16	6	13.88	-1.0	-6.7
Q	AUTODESK INC	34	12	28.50	-0.8	-2.6
N	AUTO DATA PROCESSING	55	16	39.50	-0.5	-1.3
Q	BOOLE & BABBAGE INC	12	5	8.75	-0.5	-5.4
N	COMPUTER ASSOC INTL INC	37	15	28.50	-0.6	-2.1
Q	COMPUTER HORIZONS CORP	15	7	11.63	0.6	5.7
N	COMPUTER SCIENCES CORP	73	38	42.38	-1.0	-2.3
N	COMPUTER TASK GROUP INC	16	9	13.00	0.0	0.0
Q	COGNOS INC	17	4	5.44	-0.3	-4.4
Q	COMSHARE INC	27	12	19.75	-1.3	-6.0
N	CULLINET SOFTWARE INC	14	4	7.75	-0.4	-4.6
Q	DUQUESNE SYS INC	22	10	18.00	-0.8	-4.0
A	DATA ARCHITECTS INC	16	7	13.75	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	39.50	0.6	1.6
Q	HOGAN SYS INC	14	3	4.00	-0.5	-11.1
Q	INFORMIX CORP	31	12	23.00	-1.0	-4.2
Q	INTELLICORP INC	8	2	3.13	0.1	4.2
Q	KEANE INC	16	6	12.50	1.3	11.1
Q	LOTUS DEV CORP	40	19	23.25	-0.5	-2.1
Q	MANAGEMENT SCI AMER	14	6	9.13	-3.8	-29.1
Q	MICRO PRO INTL CORP	7	2	2.06	-0.6	-23.3
Q	MICROSOFT CORP	79	37	66.75	-2.0	-2.9
Q	MORINO ASSOCIATES INC	20	7	19	-0.4	-2.0
Q	NATIONAL DATA CORP	34	20	24.88	1.9	8.2
Q	ON LINE SOFTWARE INTL INC	22	6	6.50	0.1	2.0
Q	ORACLE SYS CORP	22	8	20.75	0.0	0.0
N	PANSOPHIC SYS INC	28	11	16.50	0.3	1.5
Q	POLICY MGMT SYS CORP	30	15	23.50	-0.5	-2.1
Q	PROGRAMMING & SYS INC	14	7	11.44	-0.1	-0.5
Q	REYNOLDS & REYNOLDS CO	38	14	18.50	-0.3	-1.3
Q	SEI CORP	22	10	18.50	-2.0	-9.8
Q	SHARED MED SYS CORP	30	19	21.25	-0.8	-3.4
Q	SAGE SOFTWARE INC	15	5	6.63	0.0	0.0
Q	SOFTWARE PUBG CORP	25	5	23.38	-1.3	-5.1
A	STERLING SOFTWARE INC	12	6	6.63	-0.3	-3.6
Q	SUNGARD DATA SYS INC	20	10	18.38	-0.4	-2.0
Q	SYSTEMATICS INC	34	19	33.25	0.0	0.0
N	SYS. SOFT INC	24	7	19	-0.3	-1.3
Q	VM SOFTWARE INC	21	7	14.75	-1.0	-6.3
	Semiconductors					
N	ADV MICRO DEVICES INC	25	8	14.88	-1.1	-7.0
N	ANALOG DEVICES INC	24	8	14.63	-0.5	-3.3
Q	ANALOGIC CORP	13	5	7.63	0.1	1.7
Q	INTEL CORP	42	18	36.25	1.1	3.2
Q	LSI LOGIC CORP	15	7	12.25	-0.5	-3.9
N	MOTOROLA INC	74	35	52.25	0.0	0.0
N	NATL SEMICONDUCTOR	22	10	11.88	-0.4	-3.1
N	TEXAS INSTRS INC	80	36	45.75	-2.9	-5.9
A	WESTERN DIGITAL CORP	30	11	14.50	-0.6	-4.1
	Peripherals					
Q	ALLOY COMP.	13	2	2.50	0.2	8.1
N	AM INTL INC	9	3	5.13	-0.1	-2.4
N	AST RESH INC	21	6	15.50	-0.5	-3.1
Q	AUTO TROL TECH CORP	7	3	5.13	0.3	5.1
Q	BANCTEC INC	14	5	8.00	0.0	0.0
Q	CIPHER DATA PRODS INC	12	4	9.75	-0.1	-1.3
A	COGNITRONICS CORP	5	2	3.25	0.4	13.0
N	COMPUGRAPHIC CORP	28	19	26.88	0.0	0.0
A	DATAPRODUCTS CORP	24	7	10.00	-0.3	-2.4
A	DATARAM CORP	8	5	7.00	0.1	1.8
N	EASTMAN KODAK CO	71	39	43.88	-1.6	-3.6
Q	E M C CORP MASS	29	6	6.00	-0.5	-7.7
Q	EMULEX CORP	9	4	7.13	-0.1	-1.7
Q	EVANS & SUTHERLAND	35	14	16.25	0.5	3.2
Q	ICOT CORP	8	3	3.50	-0.1	-3.4
Q	INTERLEAF INC	24	11	12.38	0.5	4.2
Q	IOMEGA CORP	5	1	4.19	-0.4	-9.4
Q	LEE DATA CORP	6	3	3.50	0.3	7.7
Q	MASSTOR SYS CORP	6	1	2.25	0.0	0.0
Q	MAXTOR CORP	19	6	9.38	-2.3	-19.4
Q	MICROPOLIS CORP	40	13	16.13	-1.9	-10.4
Q	MINISCRIBE CORP	17	5	13.00	0.0	0.0
N	MINNESOTA MNG & MFG CO	84	45	63.88	-1.4	-2.1
A	MSI DATA CORP	19	8	14.00	0.5	3.7
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	5.25	0.0	0.0
Q	PRIAM CORP	4	1	1.63	0.0	0.0
Q	PRINTRONIX INC	13	7	10.13	-0.1	-1.2
N	QMS INC	27	8	8.38	-0.4	-4.3
Q	QUANTUM CORP	19	8	10.75	-0.5	-4.4
Q	RAMTEK CORP	6	1	0.81	-0.1	-13.3
N	RECOGNITION EQUIP INC	21	6	8.00	-0.1	-1.5
Q	REXON INC	11	4	6.75	0.0	0.0
Q	SCAN TRON CORP	17	7	15.50	0.0	0.0
Q	SEAGATE TECHNOLOGY	33	10	18.13	0.3	1.4
N	STORAGE TECH CORP	4	1	2.50	-0.4	-13.0
Q	TANDON CORP	6	1	2.56	0.3	10.8
A	TEC INC	6	3	3.69	0.2	5.4
N	TEKTRONIX INC	41	21	24.88	-0.6	-2.5
Q	TELEVIDEO SYS INC	3	1	1.06	-0.1	-10.5
N	TELEX CORP	75	30	49.00	0.0	0.0
Q	WYSE TECH	40	11	21.50	-0.3	-1.1
N	XEROX CORP	85	50	54.50	-0.3	-0.5
Q	XIDEX CORP	15	5	8.75	2.5	40.0
	Leasing Companies					
Q	CAPITAL ASSOCIATES INTER-NATIONAL INC	6	3	6.25	-0.6	-9.2
N	COMDISCO INC	37	12	23.00	-1.1	-4.7
N	CONTINENTAL INFO SYS	10	4	6.00	-0.6	-9.5
Q	PHOENIX AMERN INC	12	5	3.00	-0.3	-7.7
Q	SELECTERM INC	5	2	4.50	-0.8	-14.3

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Lazy days

The market takes a catnap in the summertime haze

Summer doldrums hit Wall Street last week as slow trading saw the Dow Jones industrial average slip below the 2,100 mark for the first time in three weeks, and major computer issues slid. Hardest hit was Management Science America, Inc. (MSA), which dropped dramatically when Computer Associates International, Inc. said it would not pursue its $11.50-per-share offer for the Atlanta software maker (see story page 83). MSA's stock slipped 4½ points from a week earlier to finish at Thursday's close at 8½.

In other action, Digital Equipment Corp. fell 3½ points to 108⅞; Hewlett-Packard Co. dropped 2⅛ points to 52¾, despite announcing a countersuit against Apple Computer, Inc. in its software copyright dispute (see story page 7); Unisys Corp. dropped 2⅛ points to 33½ as allegations of overcharging the U.S. Army for computer work swirled; IBM dropped 1⅝ points to 124¾; NCR Corp. fell 1⅛ points to 61¼; and Microsoft Corp. was down 1½ points to 67. No. 2 computer lessor Continental Information Systems Corp. plunged 1½ points Thursday and 1⅞ points for the week to 4½ after announcing a $7.5 million quarterly loss.

JAMES DALY

Processors

FROM PAGE 1

seen demonstrations of the system. "In terms of text-search capabilities, this potentially puts light-years between Dow Jones and anything else I've seen," McConville says. "Others, such as Reuters and Nexis, will have to start thinking about this technology. But Dow Jones has got the financial community sewn up."

Dunn and Charles Brady, director of systems development at Dow Jones, had no interest in being pioneers, but they didn't shy away either.

The News/Retrieval Service, which provides access to more than 40 data bases, including financial data, news wire information and corporate profiles for its worldwide retail and wholesale subscription service, was hitting a technological wall.

Dow Jones dominates the financial on-line data base market; its estimated 290,000 subscribers are twice the number of its nearest competitor, Reuters, according to the Information Industry Bulletin.

'We had a catch-22'

The Information Services Group was growing faster than any other part of Dow Jones, a $1.4 billion information services giant. But the current system — IBM 3090s and 4300s and Digital Equipment Corp. VAXs — couldn't keep up with the demand. "We had a catch-22," Dunn says. "The bigger we got and the more precise an individual wanted to be in his search [through the News/Retrieval data bases], the more complicated the search mechanism had to be. We looked up and down for a solution, but it seemed like there was none."

Complicating matters was the need to use tough-to-remember prompt codes — Boolean, according to Dunn — to be able to use the services. For example, a user on the news service must remember to type //CQE to get on-line stock quotes. This forced many users to become technicians and turned off others.

Eighteen months ago, Dunn noticed a small article in *Business Week* that mentioned Thinking Machines and its futuristic device. Fascinated, Dunn arranged a visit to Cambridge for a demonstration. He couldn't decipher the technical descriptions. "It was a 12-sided hypercube — I thought that was something you put in a drink," Dunn recalls.

Looking to the Connection Machine seemed like risky business. Dunn and Brady first needed to feel assured that start-up Thinking Machines would survive as a vendor. After meeting with company President Sheryl Handler and some of its principal technical people, Dunn and Brady felt that the young company was on a solid footing.

But what about the machine itself? The 4-year-old technology relies on a radical rethinking of traditional computing. Rather than one or a handful of processors running at high speed, the Connection Machine relies on 65,000 small processors working in concert to share a specific task. But among its applications — ray-tracing, wind-tunnel simulation, hydrodynamic modeling — the computer did a bang-up job with data retrieval. For Dunn, that rang a bell.

GLENN RIFKIN

Dow Jones' *Brady and Dunn with the Connection Machine*

Massively parallel, the Connection Machine whisks through data bases doing data retrieval at breakneck speed even though its 65,000 processors are actually inexpensive microprocessors.

Programs for the Connection Machine are written as if they were operating on one data object rather than thousands. According to Ted Tabloski, director of system software development at Thinking Machines, "This is a much more sound way than sequential processing to approach problems that are data-intensive."

Integrated into the Dow Jones News/Retrieval Service, such a machine could revolutionize the application, Dunn realized.

Unlike current electronic search services, which scour data bases for key words and turn out only data with references to those words, the Connection Machine can blanket a data base and do concurrent pattern matching. The result is that the Connection Machine is capable of doing sophisticated referential searches based on a virtual natural language interface. It will turn up related material that a conventional search tool would never find.

Dunn and Brady didn't hesitate; they set the wheels in motion to purchase the computer. With revenue growing at more than 25% annually and pretax margins of 40%, the Information Services Group is the fastest growing division of Dow Jones, displacing the company's hugely successful newspaper, *The Wall Street Journal*, as its top grower. The company purchased 56% of Telerate, a global electronic-network financial data provider and that, coupled with Dunn's own division, now represents 30% of the company and 50% of the operating income. The time to press the pedal to the metal, Dunn figured, was now.

Bury the competition

Dunn and Brady and the rest of the Information Services Group want to continue the high growth and put even more distance between themselves and competitors such as Reuters, Compuserve, Inc., Nexis and other on-line electronic information providers. Until the new system goes on-line, they won't be able to determine whether they've hit pay dirt or installed a white elephant. As Dunn points out, there is no way to do market research on this type of offering because it's never been done before.

McConville won't venture an estimate on bottom-line returns, but he is convinced that the margins from this service will exceed the 40% that the Information Services Group is currently realizing. With that kind of potential, it didn't require much fast-talking to get management to sign off on the Connection Machine. "Historically, we've always looked to technology to solve problems," Brady says. For example, in order to turn *The Wall Street Journal* into the largest circulation newspaper in the U.S., technological advances were a must. Dow Jones was the first nongovernmental commercial user of satellite technology.

Brady points out that the strength of the system is to produce the *real* answer they are seeking through the relevance feedback of the Connection Machine. "A trained librarian can find basic things faster on the current system," Brady says. "But on things that are difficult to find, the new system will win hands down."

The new system will likely incorporate a new payment mechanism as well. Intended as a place for someone to "browse" for information, the service will switch to a per-item charge.

McConville says he believes that Dow Jones should and will charge a premium for the service. Brady points out that when the Connection Machine goes on-line later this year, the old service will remain intact; users will have a choice.

The big picture

In addition, Dunn and Brady plan to create a data base of great breadth rather than depth. They say that most users want current information rather than five years of *The Wall Street Journal*. The new system will incorporate six months worth of hundreds of publications such as the *Journal, Fortune, Business Week, USA Today* and dozens of regional newspapers and other resources.

Beyond the cost of the computers, Brady calculates that the total investment in the Connection Machine is already $8 million, and if all goes according to plan, Dow Jones will purchase many more. Because Dow Jones is using the Connection Machine in its first business application, Dunn realizes the impact the account has. He estimates the $5.3 million purchase represented 20% of Thinking Machines' revenue last year.

"With Thinking Machines, we were the great white hope," Dunn says. "They were tired of blasting missiles out of the air or splicing genes in a mouse gonad. Here was something that could actually benefit mankind."

For Dunn, the excitement of the technology pales quickly within the corporate world. Though management was accepting of his risky venture, Dunn knows that the project must make good business sense. Until the system goes on-line, many of the business questions cannot be answered. But Dunn is hardly cautious in his prognosis. "If it does what we think it will do and the usage is what we think it's going to be, we can't buy enough Connection Machines," he says.

In plain English, please

Dow Jones News/Retrieval Service dominates the financial on-line data base market with twice the subscribers of its nearest competitor. But subscribers have long been frustrated with the complexities of using the service, a frustration acknowledged by Dow Jones Executive Vice-President Bill Dunn.

"We have this fantastic service," Dunn says, "a wonderful business amalgam of 70 billion characters of information on computers in networks, on packet switches, with terminals and personal computers. And if I walk up to this fantastic collection and say 'How is Boeing doing in its competition with Airbus?' I'll wait . . . and wait . . . and then I'll see 'Zero documents.' Then I play the machine's game. I type in 'Boeing' . . . I get 8,763 documents. I try Boeing and Airbus . . . 392 documents. And the meter is ticking at $2.40 per minute, and someone wants the answer and you're on the phone and sweating a bit. Then I say, 'The heck with it, it's not worth it.' " Dunn is outspoken in his distain for the unfathomable "Boolean" gibberish needed to prompt today's computers.

In turning to the Connection Machine, Dow Jones hopes to eliminate these barriers. The Thinking Machines Corp. software developers created an algorithm using LISP, the artificial intelligence language, to allow commands to be entered into the Connection Machine in plain English. That algorithm, written for a Symbolics, Inc. AI workstation, needed to be ported to the C language so that Dow Jones could use its Digital Equipment Corp. VAXs running Ultrix as a commercial front end. Dow Jones and Thinking Machines are currently working together to create the software necessary to run all of the system's programs.

Dunn can already demonstrate the user interface on an Apple Computer, Inc. Macintosh II in his office. With the Connection Machine, a subscriber will be able to dial into the Dow Jones service, type in a question on his PC or Macintosh in plain English — for example, "Tell me the competitive situation between Boeing and Airbus," and receive a list of story references from the massive data base. The user can then electronically check off those stories that seem most applicable; the Connection Machine will collate and match every similar word in all the stories. It will produce a more detailed list of stories until the searcher finds what he seeks.

For this, Dunn views the $8 million investment in the Connection Machine as a drop in the bucket. "Compared to the $250 million the company spends on new presses, this is hardly a big expenditure," he claims. And Dunn is hardly in awe of his new technology.

"The Connection Machine is really an idiot," Dunn says. "It runs like a son of a bitch, but it drools at the end of a 100-yard dash. You have to have another mechanism that wipes its mouth, pulls its pants up and takes it over to get the blue ribbon."

GLENN RIFKIN

CASE

FROM PAGE 1

generation languages in favor of Cobol on the production end because those languages lack the performance needed for transaction processing, he added.

"This is probably the first major coprocessing application in the computer industry and definitely is the first of its type in the financial world," Bedell said. Three disparate architectures, none of which individually represents a revolutionary development, act as one, he said.

"It is integrating all of these non-breakthrough technologies that is a breakthrough," Bedell said. He added that the trading system would have been impossible without the use of the CASE tool, known as High Productivity Systems.

The PCs, equipped with Microsoft Corp.'s Windows, handle the user interface and tasks such as data validation. More than 90% of the transaction processing is done on the Stratus systems, while mainframes running IBM MVS and DB2 handle reporting and act as the corporate data repository.

Workhorse

The bulk of First Boston's business processing is handled by the trading system, and even applications such as Fortran-based financial analysis systems running under IBM VM can be called up under Windows, with information being transferred to the trading system through a cut-and-paste capability.

First Boston's Bedell

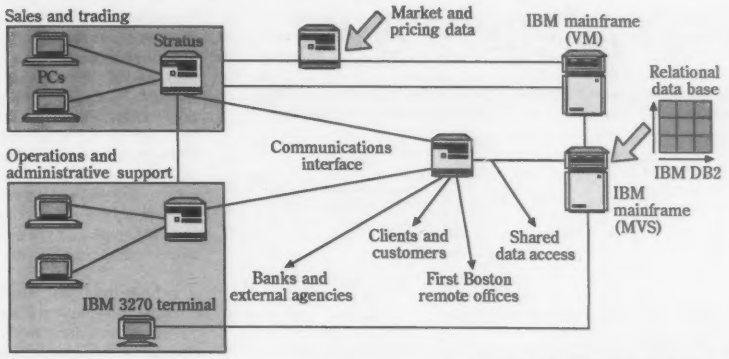
The development project was kept out of the public eye through First Boston's refusal to grant in-depth media interviews and was at least partially shielded from some of the organization's vendors, Bedell said, noting that First Boston kept the project under wraps until it was confident the system worked as planned.

Kidder Peabody became involved less than a year ago when officials "heard through the grapevine" that First Boston was looking for a licensee for its new system, according to a Kidder Peabody representative. Meanwhile, First Boston had heard that Kidder Peabody was searching for a trading system. Bedell said First Boston is evaluating whether to offer the trading system to other customers and has installed the CASE tool at several companies that may license it.

First Boston will license the trading package — stripped of some proprietary techniques — and the CASE system to Kidder Peabody for an undisclosed fee. As part of the agreement, Kidder Peabody will add a retail trading application to the trading and clearance system for both organizations.

Wholesale trade

First Boston's Trade Processing Architecture System offers seamless three-tier integration to First Boston and Kidder Peabody



INFORMATION PROVIDED BY FIRST BOSTON CORP.

Moynihan

FROM PAGE 1

fect on the industry than he expected when he slipped the provision into the Tax Reform Act of 1986. At the time of enactment, congressional staffers estimated that Section 1706 would raise roughly $12 million per year in tax revenue, but a more recent estimate puts the figure at $100 million per year.

Joseph E. Collins, director of public affairs for the Data Processing Management Association in Park Ridge, Ill., praised the bill for providing a clear-cut definition of independent technical contractors that will reduce uncertainty in the industry. "It's a very clear test, and it's more applicable to the data processing industry than the common-law test was," Collins said.

Moynihan's new "safe harbor" test for technical service workers, including computer programmers and systems analysts, has two major requirements for obtaining independent contractor status:

- First, the contractor must have a written contract stating that he is not an employee of the broker; that the contractor reserves the right to perform technical services for more than one broker and more than one client; and that the broker does not indemnify the contractor from the risk of financial losses.
- Second, the duration of the contractor's continuous service for a client must not exceed 18 months. During gaps in the work, the broker may not provide compensation such as vacation pay.

This test is expected to be easier for contractors to meet, but a third provision of the compromise bill imposes a 10% tax-withholding requirement on independent contractors in order to offset the loss of tax revenue.

Independents in favor

Leaders of the independent consultant community, which strongly opposed Section 1706, said they will support Moynihan's bill. But sources predicted that ADAPSO, a trade association for computer services firms, will continue to support Section 1706 and oppose attempts to weaken it. ADAPSO officials declined to comment until member firms are polled.

Joel Brust, chairman of ADAPSO's federal tax overview committee and founder of Amtec Systems Corp. in Los Angeles, criticized the bill as full of "tremendous loopholes. These tests are no test at all. Any employee could pass them and become an independent contractor tomorrow."

The Moynihan bill, designated S.2626, was referred to the Senate Finance Committee and could be included in a technical corrections bill.

"It looks like something we can live with," said Jack Christensen, executive director of the Independent Computer Consultants Association in St. Louis. Harvey Shulman, attorney for the National Association of Computer Consultant Brokers, said his group also supports the bill. "It's a compromise. It's not as liberal as the old safe harbor [repealed by Section 1706], but it's a fair bill," he said.

If the conditions in Moynihan's bill are not met, then a judgment about the contractor's status would be based on the more stringent common-law tests, such as whether the broker has control over the contractor's work.

Standards top CASE summit

BY NELL MARGOLIS
CW STAFF

CAMBRIDGE, Mass. — Last week's CASE '88 colloquium boasted a full panoply of the predictable technology sessions and tool displays and one entirely novel item: the first Standards Coordination Meeting in the brief but controversial history of CASE.

With the plethora of suggested standards threatening to become as unwieldy as the number of computer-aided software engineering (CASE) products that made standardization a burning issue, representatives of nine leading standards proponents met for a day. Their purpose: to summarize their efforts to date and lay a foundation for standardization of the standards.

While statements such as, "We have to have standards — and soon — for strategic, fiscal and technological reasons," drew general agreement, sentiment varied widely as to what aspects of the overall CASE environment should be standardized, which should come first and whether the effort should be under the aegis of an objective, overarching organization.

The group also debated whether such an organization could be founded and even where and whether and how the currently proffered standards represented at the meeting complement or contradict each other.

Thumbs-up

Nevertheless, the summit — conceived not as a work session from which a concrete plan would emerge but as a foray into communication where little to none has thus far existed — was widely seen by its attendees as a success.

"I've never seen anything like this meeting," said Dave Sharon, editor of the newsletter "CASE Outlook." Both a greater than expected turnout and unanticipated eagerness to share information and band together to enhance the chances of standards in the near future, he said, "shows that there is a hunger for this kind of thing."

In fact, in addition to agreement that clear standards are indispensable to the successful commercialization and use of CASE technology, one consensus that emerged was that one meeting was not enough. Plans for a second, perhaps week-long standards summit are already under way — generated not by last week's hosts but by the invitees.

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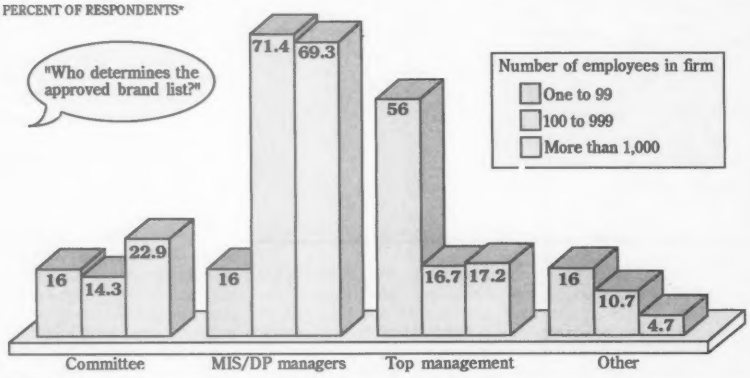
TRENDS

Information systems buying

MIS managers call the shots on computer purchase options



*Base of 192 respondents; percentages total more than 100% because of multiple answers

The concept of approved brand lists for computer equipment and software acquisitions is showing strength in large companies, with those firms also most likely to rely on committees to provide a stamp of approval for brand names.

While about 30% of American companies surveyed reported that they have an approved brand list for information processing equipment and services, that average soars to 46% for companies employing more than 1,000 workers.

In a look at who makes decisions on information processing moves and the results of those decisions, *The Wall Street Journal* found that approved brand lists are most likely to be compiled by MIS managers in midsize firms (100 to 999 workers) and large companies. Those shots are called by top managers in smaller companies.

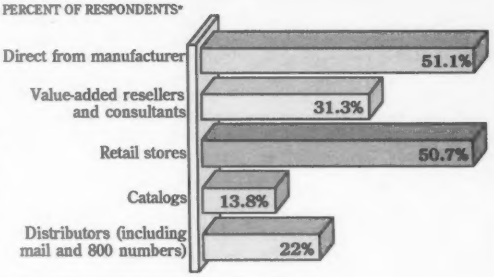
While individuals still set product standards in most companies, actual acquisition decisions are more likely to be made by committees working out of headquarters and influencing all divisions and units.

Turning their attention to individual personal computer acquisitions, the researchers found the most commonly used channel is direct from the manufacturer (51.1%), although just more than half of the respondents (50.7%) cited retail stores as their preferred channel.

The PC acquisition figures were based on the responses of 753 managers who said they evaluate PC needs, suggest brands or specifications, select manufacturers or authorize acquisitions.

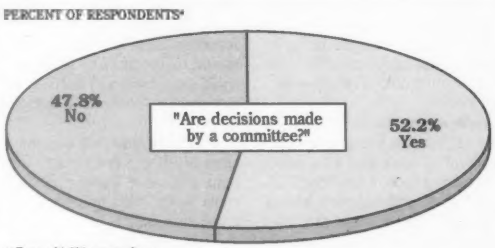
JAMES CONNOLLY

Where they buy their PC products



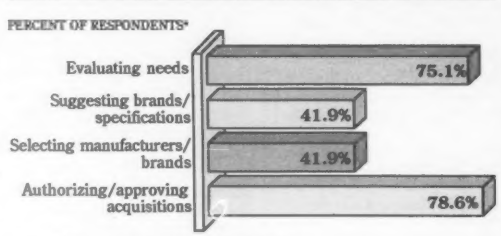
*Base of 753 respondents; multiple answers allowed

Most firms give a committee the final say



* Base of 1,039 respondents

Committee's main function is to OK buys



*Base of 542 respondents; multiple answers allowed

INFORMATION PROVIDED BY THE WALL STREET JOURNAL
CW CHARTS

INSIDE LINES

Boss DOS and flying RTs. The long anticipated DOS 4.0 from IBM is expected to be introduced in New York tomorrow. Sources said the personal computer operating system software will include a graphical user interface with menus. Additionally, DOS 4.0 will break down the 32M-byte partition barrier on the user's hard disk, precluding the need for DOS partitioning software and allowing support for huge, single-volume hard disks, one source said. Also watch for two new versions of the IBM's RT Personal Computer, the slow-selling reduced instruction set computing-based computer that IBM still calls its "workstation of choice." On Tuesday, expect to see a new desktop model and a tower model boasting quicker processing speeds.

A scheduling tool might be more helpful . . . for Wang, which said it will add new models to its VS line of minicomputers, announcing the VS 5000 series on July 26. One analyst suggested the products will likely fall in the midrange of the product line. Fred might want to schedule this one in New York, as most scribes will be far away from Lowell that day for . . .

The latest F-stop. IBM will roll out its top-of-the-line 3090 Series F models, also on July 26, several analysts say, but one suggests the firm will leave the 3090s several MIPS short of the Amdahl 5990 models announced recently.

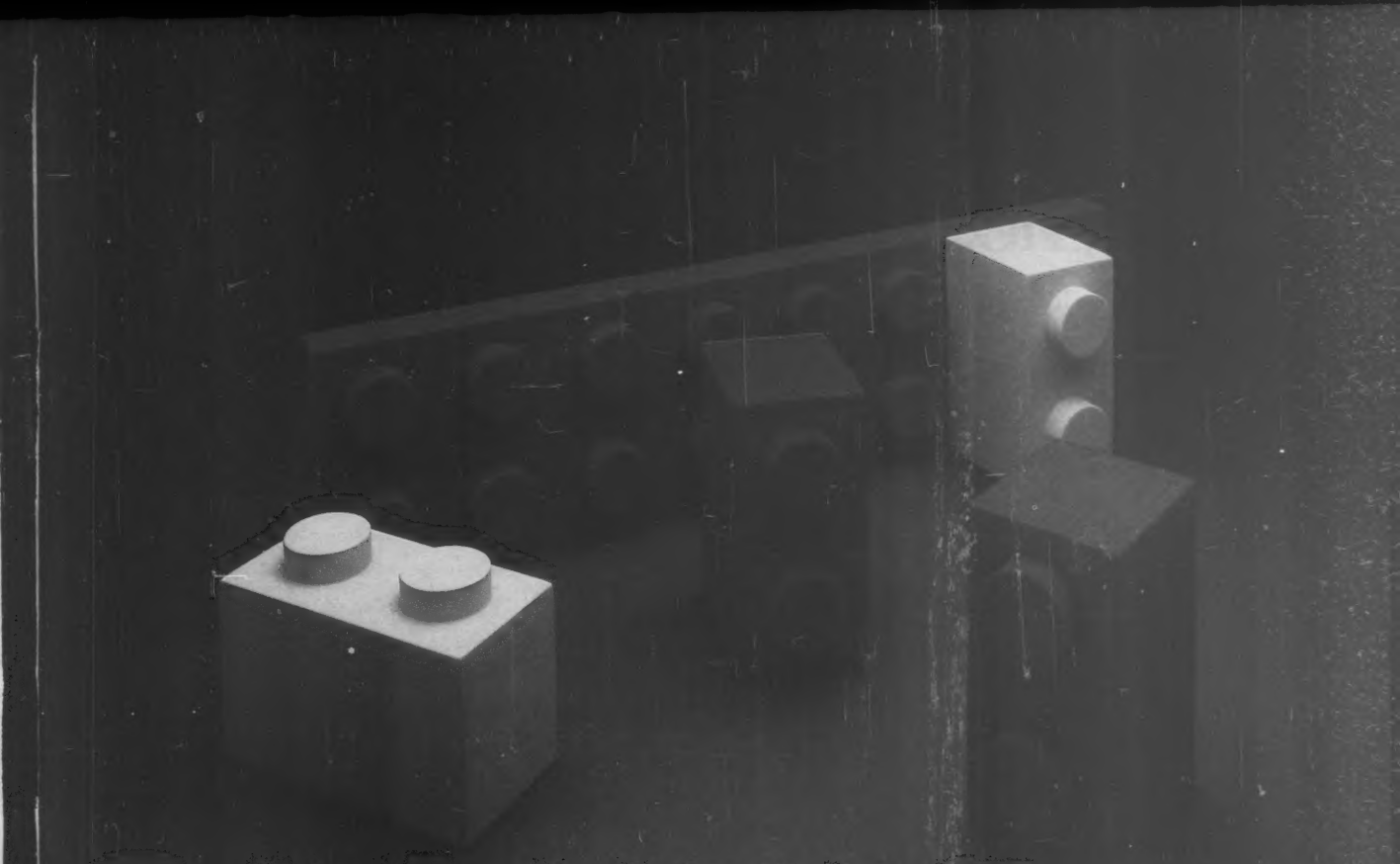
Crocodile Chapman II? Former Cullinet Chairman and Chief Executive Officer David L. Chapman is taking on both offices again — this time at the new U.S. headquarters of Computer Power Group, Australia's largest computer software and services company. With four stateside acquisitions already under its belt, the Aussie entry might be looking to Chapman's shopping skills as well as to his executive acumen; it was during the Chapman administration that Cullinet went on a shopping spree that netted it five companies.

Hypothetical user benefits. AT&T just released the specifications for an IBM PC interface that links to nothing right now but could eventually bridge users to an as yet unannounced AT&T service that would provide alarms and performance information about AT&T's Accunet T1.5 lines. An AT&T spokeswoman emphasized that the service is still hypothetical but hinted that it could include a graphics-based user interface.

Stay by the phone. Two East Coast venture capitalist groups last week went public with a $15.63-per-share cash offer for Micom Systems stock that would result in spinning off two subsidiaries — Interlan and Spectrum Digital. While Micom has until July 20 to respond, it is also mulling over some other offers, according to an executive at one of its subsidiaries. He said the announced offer was nothing new but expressed surprise at the deadline date and Micom's decision to issue a press release. The executive and several analysts are expecting Digital Communications Associates to counteroffer, although a board meeting last week did not produce one. The venture group offer almost matches Micom's original buy-back offer of $16 per share, a move prompted by an effort to buy out some large stockholders.

Sweet-talk those bureaucrats. Trying to get your hands on that hard-to-find document at the Federal Communications Commission? When a charming smile doesn't work, some researchers have resorted to small-time bribery to persuade the "rude and abusive" staffers in the FCC's public reference room to retrieve a public docket, according to congressional investigators. The best bribe is a bag of Mrs. Fields cookies, one paralegal testified. But FCC officials say they are instituting reforms — and presumably have put a stop to the cookies scam.

Last week's item about DEC's talks to acquire technology from Mips Computer Systems reportedly was confirmed to daily publications and analysts Thursday. We didn't get our callback until Friday, but no problem. We rely on our readers for the early word, so call the hot line at 800-343-6474 or 508-879-0700 and tip off News Editor Pete Bartolik to information your vendors either plan on releasing or hope to keep under wraps.



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